Technical drawing Syllabus – 2 period Complementary course – S6-S7

APPROVED BY THE JOINT TEACHING COMMITTEE AT ITS MEETING OF 12 AND 13 OCTOBER 2017 IN BRUSSELS

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1. **General Objectives of the European Schools**

*European Schools* have two objectives: offer a formal education and promote the personal development of students in the broadest possible social and cultural contexts. Formal education implies the acquisition of competences (knowledge, abilities and attitudes) through a range of different fields. Personal development has an important role in different spiritual, moral, social and cultural contexts. For students, this implies displaying an adequate conduct consciously, comprehending the environment in which they live, and developing their individual identities.

*These two objectives are nourished from the rising sensibility of the wide European culture. Experiencing a shared European life should encourage students to respect the traditions of each country and region in Europe, while developing their own national identities.*

*Students in European Schools are the future citizens of Europe and of the world. As such, they need a wide range of basic competencies, in order to overcome the challenges presented in world of permanent change. In 2006, the European council and the European Parliament adapted a new European framework with the key competences for education through life. This framework identifies 8 key competences which every individual requires for their personal development, social inclusion, active citizenship, and for employment:*

1. Communication in their mother tongue
2. Communication in other languages
4. Digital competences
5. Learning how to learn
6. Social and Civic competencies
7. Sense of initiative and business spirit
8. Consciousness and cultural expression

*The programs of European Schools seek to develop all these key competences in pupils.*

**1.1. Introduction to Technical Drawing**

Drawing is something inherent to humanity due to an elemental need to communicate, which is their primary function. Technical drawing is a means of expression and communication, essential for the development of processes of scientific investigation, of technological projects, or of scientific intervention with the aim of creating an industrial or artistic product. Its principal function consists in formalising or visualising what is being designed or discovered, providing a first concretion of possible solutions, through to the final stage of development, in which results are presented in definitive plans. It is a compulsory language for all those people who communicate technically at any level and want to convert their work into a creating activity. It contributes effectively to communicating ideas at any stage of their development; in sketch phase, it is an ideal instrument to developing, through the confrontation of opinions, investigation projects or design proposals. This communication function that
characterises technical drawing helps in the creation phases and posterior informative
diffusion of the designed object, which makes it an essential instrument for the
development of scientific, artistic, and technological activity. It also allows a fluent
dialogue between creator and user, through a combination of norms and conventions
that characterise the specific language of technical drawing, and who provide an
objective, trustable and universal character.

Technical drawing arises in the universal culture as an indispensable means of
expression and communication, for the development of investigation processes about
shapes, as well as for the graphical comprehension of technological or artistic
sketches and projects, whose end is the creation of products that can have an artistic
or technological value, or both at the same time. The essential function of these
projects consists in helping to formalise of visualise what is being created or designed,
and contributes to provide a first overview of possible solutions, and the presentation
of results in finished drawings.

Technical drawing should also be contemplated from the point of view of reading and
comprehension of ideas and projects of somebody else. In the drawing, there is a
precise definition of analytical instrumental functions, and expression and
communication of the visual aspects of the ideas and shapes. The development of the
capacities connected to these functions constitutes the main educational purpose of
this subject. In order for communication to be effective, it is necessary that users agree
upon the existing relationships between graphical signs and the aspects of reality to
which they refer. Graphical expression in their instrumental and formative aspects,
allows to represent ideas graphically, communicating these to others in a concise way,
detailing propositions before undertaking final solutions. The mastery of the rules and
normative aspects of technical drawing is a guarantee that the adequate competences
are possessed, in the field of technical or artistic communication.

Knowledge about a group of conventionalisms which are integrated in the norms for
technical drawing, and are established at national and international levels, is
necessary. The subject favours the capacity of abstraction for comprehension of
numerous outlines and conventionalisms, which means it is a valuable formative help
of general character. Technical drawing entails the development of the capacities of
judgement, and the adequate skills for resolving representations of those forms
belonging to the field of the industry, of design or art, while favouring the judgement
of the value that technical representation has on the artistic process of design and
contemporary culture. It is needed to maintain basic contents along with new
educational contents reclaimed by a social evolution as well as by the scientific-
technical advances. The activities of drawing cannot be designed as abstract models.

The acquisition of abilities, skills, and theoretical knowledge is developed through the
constructive action of students. The teacher can program assignments which allow
improving these skills at different levels. It is important that the progress of students is
considered more in relation to their individual starting points, than in function of an
initially established learning product. Technical drawing is covered in two courses, in
a way that establishes a general ad complete vision from the first one, expanding and
applying the concepts in usual technical solutions in the second.
The contents are developed in a parallel way through both courses, but in their summaries, the level of detail, applications and specific exercises, are determined. In summary, each course has as objective to consolidate the previous knowledge, increase the level of detail, and search technical and practical applications.

1.2. General Objectives of Technical Drawing

This subject will allow students to obtain the following capacities

1. Value the possibilities of technical drawing as an instrument for investigation, understanding the universality of the objective language in the transmission and comprehension of information.
2. Develop the capacities which enable them to express with precision and objectivity the graphical solutions.
3. Understand the fundamentals of technical drawing to apply them to the reading and interpretation of plain designs and artistic products, and to elaborate reasoned solutions for geometrical problems both in the plane and in space.
4. Understand normalisation as the ideal conventionalism to simplify, not only production, but also communication, giving it a more universal character.
5. Integrate the activities of technical drawing in a cultural field where the relevance of aesthetic aspects is present, such as art, architectonic design, or industrial design.
6. Understand and represent shapes, following the norms UNE and ISO.
7. Understand that the diversity of plastic techniques improves the conventional conception of technical drawing.
8. Integrate the knowledge given by technical drawing into investigation processes, including scientific, artistic, or technological.
9. Encourage method and reasoning in drawing, as a means of transmission of scientific-technical ideas.
10. Develop skills which allow expressing graphical solutions with precision, clarity, and objectivity.
11. Use the specific instruments of technical drawing skilfully, and value the correct finishing of the drawing, as well as the improvements that diverse graphical techniques can introduce in representation.
12. Develop the skill to create sketches, to attain speed and precision in the graphical expression.
13. Relate the space to the plane, understanding the need to interpret the volume in the plane, through the systems of representation.

The basic competencies must be reached by students at the end of their compulsory education, with the aim of reaching their personal fulfilment and to be able to develop the skill of constant learning. These concepts have been taken into account for developing this syllabus, basing the teaching methodologies in the significant learning, encouraging teamwork, the completion of activities related to reality, and education in values.
2. **Didactic Principles**

Learning and teaching in subjects is based on the following didactic principles:

- **Integrated teaching and learning**: the bonds and correlations between the different aspects of the curriculum of European Schools make learning a more complete and significant experience.
- **Active learning**: students become progressively responsible of their own learning process.

2.1. **Methodology**

The methodology is based in meaningful learning, with the aim of learning things in a related way (discover and structure), before memorising and reproducing. It is an active educational methodology, aiming to facilitate the autonomy of students, and at the same time, build a stimulus for teamwork and for encouraging investigation techniques and new technologies, applying the theoretical fundamentals into daily life. Technical drawing is an especially practical science; therefore, a special emphasis is placed on procedures and activity completion.

Each unit is structured according to the following methodology:

a) **Explanation of the theoretical concepts** needed to understand the contents to develop through the unit
b) **Explanation of the procedural contents**, and execution in class on behalf of students.


c) **Completion of exercises from the activity book** in class, both individually and in groups, proposed by the teacher. These exercises will be corrected in class with participation from students.

These principles are applied through a variety of methods and strategies of teaching and learning, the use of differentiated teaching methods, and the use of a wide range of learning tools, which include digital tools.

The didactic principles are provided as a guide for teaching and learning of the different subjects.

3. **Learning objectives**

This section establishes the main learning objectives and the desired outcomes.

- **Year 6 (S6)**

  At the end of year 6, students must be able to understand the existing relationships between artistic pieces and technical drawing. They must be able to solve geometric problems, valuing the method and reasoning of constructions, as well as their finishing and presentation. They must solve problems of geometric transformation on the plane, turns, translations, symmetries, or scales. They must
know how to use the scales for interpreting planes, and for the elaboration of drawings. They must apply the concept of tangency to the solution of technical problems. They must know how to apply conic curves for the resolution of technical problems in which its definition intervenes. They must use the diedric system to represent plane figures and simple volumes. They must know how to make perspectives of simple objects defined by their fundamental views and vice versa. They must produce sketches, in the diecric system, of common and simple objects, adjusting to the norms of UNE or ISO. They must know how to finish the works of technical drawing, using the different graphical resources, in a clear and clean way, responding to the objective for which they have been produced.

- **Year 7 (S7)**

At the end of year 7, students must identify elements of technical drawing in artistic pieces, being able to establish elemental levels of integration which facilitate the comprehension of the artistic and technical aspects of drawing. They must solve shape configuration problems with polygonal outlines, and with the application of geometric transformation resources. They must know how to construct scales, and use them in the execution of specific exercises. They must design objects of common use in which tangency between circumferences, arcs and lines intervene. They must understand the fundamentals of representation systems: the Diedric system, the Dimensioned planes system, the Axonometric system and the system of Conic Perspective, and use them for the representation of polyhedral shapes. They must know how to find the real shape and magnitude, and obtain the development of a section. They must know how to apply the Diedric system, as well as the Normalisation, for the representation of technical planes necessary to describe and be able to create objects with faces oblique to the planes of projection. They must know and use some of the programs CAD, like Autocad, Sketchup, Mongee etc.
4. Content

**Technical drawing S6**

The content is divided in three big THEMATIC BLOCS

I. **GEOMETRIC DRAWING**: Metric applied geometry
   II. **DESCRIPTIVE GEOMETRY**: Representation systems
   III. **NORMALISATION**

**THEMATIC BLOC I: GEOMETRIC DRAWING**

**TOPIC 1**: DRAWING INSTRUMENTS: Characteristics and uses

**TOPIC 2**: FUNDAMENTAL OUTLINES IN THE PLANE. Parallels, perpendiculars, perpendicular bisectors, operations with angles

**TOPIC 3**: SCALES. Universal triangle of scales, construction of graphical scales, deduction of real measures of an object represented to scale

**TOPIC 4**: CONSTRUCTION OF POLYGONAL SHAPES (i). Triangles. Angles related to circumferences. Points and straight lines of a triangle

**TOPIC 5**: CONSTRUCTION OF POLYGONAL SHAPES (ii). Quadrilaterals. Regular polygons.

**TOPIC 6**: GEOMETRIC RELATIONSHIPS: Proportionality, similarity, equality, equivalence and symmetry.

**TOPIC 7**: GEOMETRIC TRANSFORMATIONS. Translation, turn, and scaling.

**TOPIC 8**: TANGENCIES

**TOPIC 9**: TECHNICAL CURVES: Oval, ovoid, spiral and scroll. Outline as application of tangencies

**TOPIC 10**: CONICAL CURVES: Ellipse, Hyperbole, and Parabola. Definition and outline.

**THEMATIC BLOC II: DESCRIPTIVE GEOMETRY**

**TOPIC 11**: DESCRIPTIVE GEOMETRY: SYSTEMS OF REPRESENTATION. Fundamentals and important characteristics of each of them.

**TOPIC 12**: DIEDRIC SYSTEM (I). Representation of a point, straight line, and plane.

**TOPIC 13**: SYSTEM OF DIMENSIONED PLANES.
TOPIC 14: AXONOMETRIC SYSTEM.

TOPIC 15: SYSTEM OF PERSPECTIVE

THEMATIC BLOC III: NORMALISATION

TOPIC 16: NORMALISATION. General principles of representation

TOPIC 17: NORMALISATION. Boundaries.

TOPIC 18: ART AND TECHNICAL DRAWING. DESIGN.
The content is divided in three big THEMATIC BLOCS

I. GEOMETRIC DRAWING: Metric applied geometry
II. DESCRIPTIVE GEOMETRY: Representation systems
III. NORMALISATION

THEMATIC BLOC I: GEOMETRIC DRAWING


TOPIC 2: POTENCY. Radical and central axes. Aurea section. Aurea rectangle.


TOPIC 4: GEOMETRIC TRANSFORMATIONS. Projectivity and homography. Homology and affinity.

TOPIC 5: TANGENCIES: Tangencies as application of the concepts of potency.

TOPIC 6: TECHNICAL CURVES.

TOPIC 7: CONICAL CURVES. Ellipse, Hyperbole, and Parabola. Tangencies and intersection points on a line. Other conical problems.

THEMATIC BLOC II: DESCRIPTIVE GEOMETRY

TOPIC 8: DIEDRIC SYSTEM I. Intersections of planes and of straight line with the plane

TOPIC 9: DIEDRIC SYSTEM II. Parallelism, perpendicularity, and distance. Real lineal magnitudes.

TOPIC 10: DIEDRIC SYSTEM III. Changes of plane, turns and angles. Real superficial and angular magnitudes.


TOPIC 12: SYSTEM OF DIMENSIONED PLANES. Fundamentals and applications.


TOPIC 15: CONIC SYSTEM OF LINEAL PERSPECTIVE I. Fundamentals and elements of the system.

TOPIC 16: CONIC SYSTEM OF LINEAL PERSPECTIVE II. Representation of polyhedral and revolution surfaces. Outline of perspective of interiors and exteriors.

THEMATIC BLOC III: NORMALISATION

TOPIC 17: INDUSTRIAL DRAWING. Drawing of architecture and construction.

5. Assessment

In the Baccalaureate, assessment has a regulating function of the process of teaching-learning. This implies observing and analysing what we have done or are doing, and checking if we are reaching previously set goals, in order to make decisions and modify or redirect our intervention. Regulating implies basically:

- Know what we want to achieve. In other words, clearly know what our objectives are.
- Know how to observe, analyse and interpret what happens in class, with relation to objectives.
- Know how to make decisions about what actions are needed, in order to adjust our actions to stay in line with objectives.

Assessment is a privileged instrument because students are able to control and regulate their own activity. If we take into account the active character of the process of construction of knowledge on behalf of students, and their ultimate responsibility in that process, it is reasonable to think that in final terms, it must be the students themselves who take responsibility for regulating their progress. Students must be conscious about their advances, and must detect their difficulties to try to resolve them. This would be possible if the assessment provides them with explicit reference points which help them to be conscious about what they learn, and how they learn it, to regulate their own progress, and to be progressively more autonomous.

Therefore, assessment has to adopt a processual and continuous character, in a way that is present in all types of activities, and not just in individual moments. All the activities should provide valid information about assessment. It will also be necessary to take into account all the aspects of each individual student, not only their purely cognitive aspects.
5.1 Assessment Criteria S6

1. Know the relations that can exist between artistic pieces and technical drawing
2. Solve geometrical problems, valuing the method and reasoning of constructions, as well as their finishing and presentation
3. Solve problems of shape configuration with polygonal outlines and with the application of resources of geometric transformations on the plane. Turns, translations, symmetries, or dilation.
4. Use scales for the interpretation of planes and elaboration of drawings.
5. Create technical drawings at different scale, using the previously established graphical scale and the normalised scales.
6. Apply the concept of tangency to the resolution of technical problems and to the correct finishing of the drawing in the resolution of bonds and contact points.
7. Design objects of common use and not excessively complex, in which tangency problems intervene.
8. Apply conic curves to the resolution of technical problems in which their definition, tangencies, or intersections with a straight line intervene. Outline technical curves following their definition.
9. Obtain the graphical definition of a conic shape based on the knowledge of their axes, which, in the case of the ellipse, can be real or conjugated.
10. Use the Diedric system to represent plane figures and simple volumes
11. Construct the perspective of simple objects defined by their fundamental views and viceversa.
12. Graphically define an object by their fundamental views or perspective. Create sketches, in the Diedric system, of common and simple objects, complying with the norms of UNE or ISO. Obtain the representation of industrial pieces and elements, or of simple construction, and value the correct application of the rules referring to views and simplifications indicated in them.
13. Finish the assignments of technical drawing, using the different graphical tools, in a clear and clean way, responding to the objective with which they have been created.

5.2 Assessment Criteria S7

1. Identify in artistic pieces the elements of technical drawing, being able to establish elementary integration levels that facilitate the comprehension of the artistic and technical aspects drawing.
2. Solve problems of shape configuration with polygonal outlines and with the application of resources of geometric transformations on the plane. Turns, translations, symmetries, or dilation.
3. Construct scales and use them in the execution of specific exercises and in the reading and interpretation of real measures over previously drawn planes.
4. Design objects of common use in which tangency problems between circumferences, arcs and straight lines intervene.
5. Apply tangencies to curves through geometrical procedures, or with the help of adequate outline instruments. Apply conic curves to the resolution of technical problems in which their definition intervenes.
6. Use the diedric system for the representation of polyhedral or revolution shapes. Find the real shape and magnitudes and obtain their developments and sections.
7. Apply the diedric system and normalisation for the representation of technical planes necessary to describe and create objects with faces oblique to the planes of projection.
8. From their diedric representation, develop and construct a solid polyhedral or revolution object, by doing an oblique cut to the fundamental planes, and representing it axonometrically.
9. Create the perspective of an object defined by its views or sections and viceversa.
10. Analyse the assembly of compound objects using isometric drawing and the rules of dimensioning adjusted to this system.
11. Draw in conic perspective, shapes of the environment with different viewpoints, of their external and internal aspects.
12. Use the dimensioned planes system, to solve problems of intersection, to obtain profiles of a space through its level curves.
13. Differentiate the possibilities of communication an analysis of the principal representation systems (diedric, axonometric, conic, and dimensioned). In relation to the receptor or spectator.
14. Use graphical resources such as colour, textures, shapes, signs, or transferrable symbols, etc. to expose with more evidence the data and information that technical drawing gives both technically and scientifically.
15. Graphically define an object by its fundamental views or perspective.
16. Obtain the representation of industrial pieces and elements, or of simple construction, and value the correct application of the rules referring to views and simplifications indicated in them.
17. Finish the assignments of technical drawing, using the different graphical tools, in a clear and clean way, responding to the objective with which they have been created.

5.3 Assessment and Marking

The A mark in Technical Drawing is based on the continuous assessment of participation, the assignment notebook, the class activities and homework.

The B mark is based in various B Tests per semester, which include questions about the conceptual contents.
## 5.4 Table of Descriptors for S6

<table>
<thead>
<tr>
<th>MARK</th>
<th>DENOMINATION</th>
<th>ALPHABETICAL MARK</th>
<th>DESCRIPITORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-10</td>
<td>EXCELLENT</td>
<td>A</td>
<td>The students use and possess an excellent knowledge of the use of the instruments of the subject. They perfectly use the conceptual contents to solve all problems, even those of great complexity. They perform in an excellent way in the practical assignments, with great precision, cleanliness and presentation. They know how to use the Diedric system to represent plane figures and simple volumes. They know how to create perspectives of simple objects defined by their fundamental views and vice versa. They are able to incorporate new ideas in each problem, and have a great spatial vision.</td>
</tr>
<tr>
<td>8- 8.9</td>
<td>VERY GOOD</td>
<td>B</td>
<td>The students use very well the tools of the subject. They perform very well in all of the proposed exercises, they understand perfectly the conceptual concepts, and solve very adequately any problem. They apply very well the concepts of tangencies to the solution of technical problems. They know how to obtain the graphical definition of a conic from the knowledge of their axes. They make the practical assignments very precisely and have a very good spatial vision.</td>
</tr>
<tr>
<td>7 – 7.9</td>
<td>GOOD</td>
<td>C</td>
<td>Students use adequately and correctly the tools of the subject. They understand well the conceptual contents and know how to apply them. They solve correctly problems of configuration of shapes with polygonal outlines and know how to use scales for the interpretation of planes and elaboration of drawings. They solve their practical assignments correctly with cleanliness and good precision. They possess good spatial vision.</td>
</tr>
<tr>
<td>6 – 6.9</td>
<td>SATISFACTORY</td>
<td>D</td>
<td>Students possess satisfactory knowledge about the use of the tools of technical drawing. They know how to apply the terminology of the subjects, and solve the problems about the conceptual contents in a satisfactory way. They also solve geometrical problems, valuing the</td>
</tr>
</tbody>
</table>
method and reasoning of constructions. They have spatial vision.

5 – 5.9 SUFFICIENT E
Students possess sufficient knowledge in the use of the instruments of the subject. They have some difficulties in the comprehension of the conceptual contents. They know how to apply the terminology and complete the assignments in a sufficient way. They have a lack of precision in the performance of outlines.

3 – 4.9 FAILED (WEAK) F
Students have insufficient knowledge in the use of the tools of the subject. They have difficulties in the comprehension of contents. They don’t know how to apply the terminology, have no spatial vision and perform without cleanliness and precision in the assignments.

0 – 2.9 FAILED (VERY WEAK) FX
Students don’t know how to use the tools of the subject, they don’t understand the concepts, don’t know how to use the terminology or solve problems. They don’t hand in assignments, or hand them in in very deficient conditions.

5.5 Table of Descriptors for S7

<table>
<thead>
<tr>
<th>MARK</th>
<th>DENOMINATION</th>
<th>ALPHABETICAL MARK</th>
<th>DESCRIPTORS</th>
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<tbody>
<tr>
<td>9-10</td>
<td>EXCELLENT</td>
<td>A</td>
<td>Students use and possess an excellent knowledge of the use of the instruments of the subject. They perfectly use the conceptual contents to solve all problems, even those of great complexity. They know how to use the Diedric system to represent polyhedral or revolution shapes. They know how to use the Normalisation for the representation of technical planes necessary to describe and create objects with faces oblique to the planes of projection. They perform in an excellent way in the practical assignments, with great precision, cleanliness and presentation. They are able to bring in new ideas for any proposed problem, and have a great spatial vision.</td>
</tr>
<tr>
<td>8- 8.9</td>
<td>VERY GOOD</td>
<td>B</td>
<td>The students use very well the tools of the subject. They perform very well in</td>
</tr>
<tr>
<td>Grade</td>
<td>Grade Description</td>
<td>Mark</td>
<td>Notes</td>
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</tr>
<tr>
<td>7 – 7.9</td>
<td>GOOD</td>
<td>C</td>
<td>All of the proposed exercises, they understand perfectly the conceptual concepts, and solve very adequately any problem. They know how to design very well objects of common use in which problems between tangencies and circumferences intervene. They know how to construct scales and use them in the execution of specific exercises. They make the practical assignments very precisely and have a very good spatial vision.</td>
</tr>
<tr>
<td>6 – 6.9</td>
<td>SATISFACTORY</td>
<td>D</td>
<td>Students use adequately and correctly the tools of the subject. They understand well the conceptual contents and know how to apply them. They solve correctly problems of configuration of shapes with polygonal outlines, with the application of tools of geometric transformations on the plane, such as turns, translations, symmetries or dilations. They solve their practical assignments correctly with cleanliness and good precision. They possess good spatial vision.</td>
</tr>
<tr>
<td>5 – 5.9</td>
<td>SUFFICIENT</td>
<td>E</td>
<td>Students possess satisfactory knowledge about the use of the tools of technical drawing. They know how to identify elements of technical drawing in artistic pieces, being able to establish elemental levels of integration which facilitate the comprehension of artistic and technical aspects of drawing. They know how to apply the terminology of the subjects, and solve the problems about the conceptual contents in a satisfactory way. They have spatial vision.</td>
</tr>
<tr>
<td>3 – 4.9</td>
<td>FAILED (WEAK)</td>
<td>F</td>
<td>Students possess sufficient knowledge in the use of the instruments of the subject. They have some difficulties in the comprehension of the conceptual contents. They know how to apply the terminology and complete the assignments in a sufficient way. They have a lack of precision in the performance of outlines.</td>
</tr>
</tbody>
</table>

Students have insufficient knowledge in the use of the tools of the subject. They have difficulties in the comprehension of contents. They don’t know how to apply the terminology, have no spatial vision and perform without cleanliness and precision in the assignments.
Students don’t know how to use the tools of the subject, they don’t understand the concepts, don’t know how to use the terminology or solve problems. They don’t hand in assignments, or hand them in in very deficient conditions.

6. Annexes

Educational resources and uses of TIC

The textbook will be taken into account as a book for consultation and study, in which numerous explanatory drawings appear. Websites will be used as sources of information and for additional examples apart from those seen in class. Powerpoint presentations will be shown for those topics related to the normalisation of pieces, since this will improve explanations, which would be much slower in the whiteboard. Students will also work with some programs CAD, such as Autocad, Sketchup, and Mongge.

Complementary activities

Throughout the course, some complementary activities will be taken, such as visits to museums or exhibitions, which show exhibitions related to any of the content blocs, and can strengthen the knowledge in the subject as well as student’s interest.
6.1. **Examples of exams: S6 Exams**

<table>
<thead>
<tr>
<th>NOMBRE:</th>
<th>CURSO:</th>
<th>Grupo B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construye un ángulo de 120° con el compás (0,25 pto)</td>
<td>Copia o transporta el ángulo A (utilizando el compás) sobre el segmento CD dado. (0,25 pto)</td>
<td>Construye un ángulo de 30° y su suplementario (utilizando el compás). (0,25 pto)</td>
</tr>
<tr>
<td>Halla el centro de la circunferencia y dibuja un ángulo circunscrito en ella. (0,25 pto)</td>
<td>Dibuja la bisectriz de las rectas dadas r y s. (0,5 pto)</td>
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<tr>
<td>Halla el punto M desde el que se ve el segmento AB con un ángulo de 45° y el segmento BC con un ángulo de 120°. (1,75 pto)</td>
<td>Construir el triángulo: A = 75°, b = 50 mm y mc = 52 mm. (1,75 pto) Traza la circunferencia inscrita de dicho triángulo. (0,5 pto)</td>
<td></td>
</tr>
<tr>
<td>Construir el triángulo: c = 56 mm, mb = 46 mm y hb = 44 mm. (1,75 pto) Traza el barycentro del triángulo. (0,5 pto)</td>
<td>Construir el triángulo: A = 45°, c = 65 mm y wb = 50 mm. (1,75 pto) Traza la circunferencia circunscrita de dicho triángulo. (0,5 pto)</td>
<td></td>
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<tr>
<td>1.5 ptos</td>
<td>2 ptos</td>
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<tr>
<td>Construir un cuadrado cuyo lado es la mitad de la diagonal mayor de un rombo de diagonal menor 3 cm y lado 4.5 cm</td>
<td>Construir un romboide sabiendo que un vértice coincide con el baricentro del triángulo a = 6 cm, b = 3 cm y c = 5 cm, y que su diagonal es el lado a.</td>
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<th>1.5 ptos</th>
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<tbody>
<tr>
<td>Construir un trapezoide sabiendo que una diagonal de 6 cm se ve bajo un ángulo de 105°, su lado a mide 2.5 cm, y c mide 4 cm. Además se sabe que es inscriptible en una circunferencia.</td>
<td>Construir un rectángulo inscrito en una circunferencia de diámetro 6 cm sabiendo que uno de sus lados es igual al radio de dicha circunferencia.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1.5 ptos</th>
<th>1.5 ptos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construir un trapecio isósceles conociendo su altura de 5 cm, la base menor de 3 cm y una diagonal de 7 cm.</td>
<td>Dibujar un rombo conociendo la diagonal menor de 3 cm y uno de los ángulos que forman dos de sus lados, de 60°.</td>
</tr>
</tbody>
</table>
1. Determinar el arco capaz de 60° para el segmento AB.

2. Determinar el punto V desde el que se ven los segmentos AB y BC bajo ángulos de 45° y 160°, respectivamente.

3. AB = BC = CD.

4. AB y BCD son dos varillas articuladas. A es un punto fijo, B es una charrúa y C se desliza por la recta R. Hallar el lugar geométrico de los puntos B y D, cuando C, partiendo de A, se aleja al máximo de él.

5. Rectificar un cuarto de circunferencia.

6. Rectificar media circunferencia.

7. Rectificar la circunferencia.

Unidades: mm. | Nombre: | Curso: | No:
---|---|---|---
Escala 1:1 | Trazados geométricos, 2 | Fecha: | Nota:
6.2. Examples of Exams for S7

A2.- Dibujar el tetraedro regular que tiene una de sus caras en el plano vertical de proyección y se encuentra íntegramente en el primer cuadrante, sabiendo que una de las aristas de esta cara es el segmento $r$, dado por su proyección vertical. Trazar la sección producida en el tetraedro por un plano horizontal de cota 25 mm.

A3.- La pieza representada en dibujo isométrico ha sido cortada por dos planos: el plano que pasa por el punto $A$ y es paralelo al plano $zoy$ del triédro, y el plano que pasa por el punto $B$ y es paralelo al plano $zox$ del triédro. Representar, en la misma posición y con la misma orientación y escala, la parte de la pieza que resulta de retirar la porción que contiene al punto $C$ (la más próxima al observador) tras el corte con los planos indicados. El dibujo se realizará tomando como referencia los ejes dibujados a la derecha.
OPCIÓN B
EJERCICIO 1°: SISTEMA DIÉDRICO

Dadas la proyección horizontal de una pirámide regular VABCD y la traza horizontal de un plano P, se pide:
1. Representar la proyección vertical de la pirámide, sabiendo que su base ABCD se encuentra en el plano horizontal de proyección y que posee una altura de 60 mm.
2. Determinar la traza vertical de P, sabiendo que contiene el punto medio de la altura de la pirámide.
3. Obtener la sección que produce P en la pirámide.
4. Hallar la verdadera magnitud de la sección.

Puntuación:
Apartado 1  0,5 puntos
Apartado 2  0,5 puntos
Apartado 3  1,0 puntos
Apartado 4  1,0 puntos
Puntuación máxima 3,0 puntos
OPCIÓN B
PROBLEMA: TRAZADOS.

Representar a escala 3:2 la pieza croquizada, determinando geométricamente los centros y los puntos de tangencia. Comenzar la construcción a partir del punto A.