



UNIVERSIDADE FEDERAL DO CEARÁ

**FEDERAL UNIVERSITY OF CEARÁ
OFFICE OF THE VICE PROVOST FOR UNDERGRADUATION (PROGRAD)
COORDINATION FOR PROJECT AND CURRICULUM DEVELOPMENT
CURRICULUM DEVELOPMENT DIVISION**

1. Academic unit offering the curricular component (Faculty, Center, Institute, Campus):

Center of Technology

2. Department offering the curricular component (when applicable):

Transportation Engineering Department

3. Undergraduate course(s) offering the curricular component

Code of the Course	Name of the Course	Course Degree ¹	Curriculum (Year/Semester)	Nature of the Component ²	Semester of Offer ³	Habilitation ⁴
91	Telecommunications Engineering	Bachelor	2015.1	Mandatory	01	-

4. Name of the curricular component:

Technical Drawing for Engineers

5. Code of the curricular component (filled by PROGRAD):

TC0617

6. Prerequisites	No ()	Yes (x)	
		Code	Name of the curricular component / activity

7. Co-requisite	No (x)	Yes ()	
		Code	Name of the curricular component / activity

8. Equivalences	No ()	Yes (x)	
		Code	Name of the curricular component / activity
		TC0592	Technical Drawing for Engineers

9. Day period of the curricular component (more than one option can be selected):

- ¹ Fill with *Bachelor (Engineer), Licenciante, or Technologist.*
- ² Fill with *Mandatory, Optional, or Elective.*
- ³ Fill when mandatory.
- ⁴ When elective, fill with the habilitation or emphasis to which the curricular component is linked.

Morning

Afternoon

Night

10. Regime of the curricular component:

Semester

Yearly

Modular

11. Justificatory for the creation/regulamentation of this curricular component

“The main purpose of the Technical Drawing is the precise representation, in the plane, of the forms of the material world and, therefore, three-dimensional, in order to enable their spatial reconstitution, being a concise and unambiguous means of communication” (BORNANCINI, 1987).

The justification of the course arises from the need to prepare the engineering student to the challenge of interpretation and creativity in the abstract and graphic presentation of two- and three-dimensional elements.

Through the projective and technical drawing, it is possible to detail engineering projects. It is noteworthy that this technique has been improved by the use of Computer Aided Design (CAD) tools, which can be defined as a sub-area of Computer Graphics, focused on the creation and manipulation of technical drawings and designs. (BARROS, 2001).

Thus, it is expected that at the end of the course, the student will be able to:

1. Interpret building elements of an engineering project, analyzing their layout and representation in the plane;
2. Represent, through views and perspectives, the elements of a project;
3. Use drawing tools and digital resources (drawing applications) to represent elements of a project;
4. Spatially visualize, through abstraction, various geometric elements in two- and three-dimensional space using Mongean geometry.

12. Objectives for the curricular component:

The general objective of the drawing is to represent the objects in a practical and precise way, in the plane (projections) and in the space (three-dimensional representations), aiming at their reconstitution.

Among the specific objectives are:

1. Enable the student to handle drawing instruments for the rapid representation of project elements;
2. Introduce the student to the CAD tool in digital representation;
3. Develop the perception of abstract elements, graphically, through projective drawing;
4. Extend the process of abstraction and visualization of project elements through Descriptive Geometry.

13. Syllabus:

Drawing instruments and equipment. ABNT Technical Standards for Drawing. Classification of drawings. Paper formatting. Usual geometric constructions. Free-hand drawing. Quotation rules. Perspective. Cuts and sections. Prospects. Notions of Descriptive Geometry: generalities; Point representation; straight line study; special lines; visibility; bisector plans; study of plans; traces; relative positions of lines and planes. Quoted projections. Computer Graphics.

14. Program:

UNIT I - TECHNICAL DRAWING

- Chapter 1 - Teaching Plan; Identification; Teaching Methodology; Activity Calendar; Evaluation Criteria and Bibliography; Necessary instruments.
- Chapter 2 - Paper Formats, Adopted Format (A4), Representation, Instruments, Choice and Handling; Scale; Technical Standards (ABNT); Letters and Numerals; Freehand drawing of Lines, Curves and Figures.

- Chapter 3 - Geometric Constructions; Geometric Figures in the Plane with Their Elements and Regular Polygons. Replacement of instruments by the computer: Line drawings, curves and figures with Instruments and AutoCAD; AutoCAD line style and AutoCAD text style.
- Chapter 4 - Quotation: Definition; Goal; Importance; Relevant Technical Standards; Methods of Execution; Layout and Presentation of Quotation Rules.
- Chapter 5 - Orthographic Views; The Six Main Views; Auxiliary Views; Special Views; Notions of cuts; Conventions; Representation in the First Diedro; Third Diedro Representation and Representations with Counting of Views.
- Chapter 6 - Classification of Drawings; Orthogonal Axonometric Perspective (Isometric, Dimetric and Trimetric) and Oblique or Knight Perspective. Quotation of Perspectives.

UNIT II - DESCRIPTIVE GEOMETRY

- Chapter 7 - Generalities; purposes and objectives; terminology. Mongean method: land line, epura, dihedrals, trihedron and leader lines. Study of the point. Descriptive coordinates. Point positions.
- Chapter 8 - Study of the Line: classification; pertinence of point and straight line; special lines; visibility.
- Chapter 9 - Bisector planes, definitions; spatial and epic representations.
- Chapter 10 - Study of the Plan: line and plane pertinence; main straight lines of a plane; lines of maximum slope and maximum inclination; determination of straight line traces; concurrency and parallelism of lines and planes.
- Chapter 11 - Quoted Projection Topics: introduction; point; line; and plane; conventions; applications; topographic surfaces and level contours.

15. Workload description

Number of Weeks:	Number of Credits:	Total Workload in Hours:	Theory Workload in Hours:	Practice Workload in Hours:
16	02	32	32	-

16. Basic bibliography:

- 1- ALENCAR, Mariano Franca (1999). Curso de AutoCAD (disponível em formato digital);
- 2- BARROS, José Maurício de. AutoCAD 2002. 2ª Edição, Ouro Preto, 2002 (disponível em formato digital);
- 3- GIESECKE, Frederick E. et al (2002), Comunicação Gráfica Moderna. ISBN: 8573078448, Bookman. Porto Alegre-RS.
- 4- GIONGO, Affonso Rocha. Curso de Desenho Geométrico, Nobel - 3ª Edição;
- 5- LACOURT, H. Noções e Fundamentos da Geometria Descritiva, Guanabara-Koogan, Rio de Janeiro, 1995;
- 6- Poli-USP (2004). Desenho para Geologia (Vol 1 e 2). Universidade de São Paulo. Escola Politécnica. Depto. de Engenharia de Construção Civil (PCC) (disponível em formato digital);
- 7- POSSAMAI, Landoaldo (2002). Informática Aplicada à Arquitetura - AutoCAD 2000 (disponível em formato digital);
- 8- SILVA, Sílvio F (1984). A Linguagem do Desenho Técnico, Livros Técnicos e Científicos Editora, S.A., Rio de Janeiro;
- 9- Telecurso 2000. Apostilas de Desenho. (disponível em formato digital e no site: http://bibvirt.futuro.usp.br/textos/tem_outros/cursoprofissionalizante/tc2000/des_tecnico/);
- 10-ZATTAR, Izabel Cristina. Manual de AutoCAD R14 (disponível em formato digital).

17. Complementary bibliography:

- 1- BALDAM, Roquemar de Lima Utilizando Totalmente o AUTOCAD R.14, Editora Érica Ltda., 1998;
- 2- BORNANCINI, J. C. M., PETZOLD, N. I., ORLANDI JÚNIOR, H. Desenho técnico básico: fundamentos teóricos e exercícios à mão livre. V. I e II. Porto Alegre: Livraria Sulina Editora, 1987;
- 3- FRENCH, Thomas. Desenho Técnico e Tecnologia Gráfica, Editora Globo, 2a Edição, Rio de Janeiro;
- 4- MACHADO, Adervan. O Desenho na Prática da Engenharia, Câmara Brasileira do Livro, 2a Edição, São Paulo, 1977;
- 5- OMURA, George. AUTOCAD for Windows 13, SYBEX Inc., Alameda, CA, 1996;
- 6- PRÍNCIPE JR. , Alfredo dos Reis. Noções de Geometria Descritiva, Livraria Nobel S.A., Vol. 1, 17a Edição, São Paulo, 1970;
- 7- STAMATO, José et all. Desenho / Introdução ao Desenho Técnico, FENAME, Rio de Janeiro, 1972;
- 8- VENDITTI, Marcus Vinicius (2003). Desenho Técnico sem prancheta com AutoCAD 2002. Editora Visual Books, Florianópolis-SC.