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)**:**

Hydraulics and Environmental 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	09	-

4. Name of the curricular component:
Environmental Engineering

5. Code of the curricular component (filled by PROGRAD)**:**
TD0921

6. Prerequisites	No ( )	Yes (x)	
		Code	Name of the curricular component / activity
		CE0846	General Chemistry for Engineers
		TI0137	Integrated Actions in Science and Technology III

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
		TF0276	Environmental Engineering
		TF0335	Environmental Engineering

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

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1 **Fill with *Bachelor (Engineer), Licenciate,* 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.**

(x) Morning (x) Afternoon (x) Night

10. Regime of the curricular component:
(x) Semester ( ) Yearly ( ) Modular

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

Provide the student with basic knowledge of the environment, with a view to the conservation of natural resources, through mitigating actions. Give students the basics and foundations of the environmental engineering.

12. Objectives for the curricular component:

Develop academic awareness of environmental pollution issues, sustainable development and key mechanisms to minimize adverse effects of development. Train professionals with the necessary knowledge to work in environmental management activities with emphasis on impacts from engineering projects.

13. Syllabus:

Basic Environmental Concepts: Agenda 21. Kyoto Protocol. Montreal Protocol and Environmental Legislation. Global Changes. Evolution of Environmental Issues in Brazil and Worldwide. Principles of Environmental Management. Environmental Management in Engineering Companies. Environment and Pollution. Water, Soil, Air and Noise Pollution Control. Solid waste. Environmental Certification. Environmental Risks. Environmental Impacts.

14. Program:

1. Environment and pollution: biodiversity; environment; environmental engineering; relationship between engineering and environment, pollution; contamination.
2. Water: global supply and demand; lack; world water composition; main uses; water characteristics; sources of water pollution; forms of pollution; consequences of pollution; quality standards; land use impacts and mitigation measures; water legislation; potability standard.
3. Soil: soil concept; soil composition; soil formation; land use impacts and mitigation measures.
4. Air: air components; composition; features; main polluting sources; mitigating measures.
5. Technical visit.
6. Solid waste: solid waste and pollution; final destination forms for waste; advantages and disadvantages of landfill, incineration and composting; state and federal legislation.
7. Global change: human causes of global change; human consequences of global change.
8. Environmental impacts: impact concepts; impact types; impact assessment methods; environmental licensing; types of studies EIA / RIMA, PRADE.
9. Evolution of environmental issues: historical; evolution of concepts on environmental protection; definition of environmental management with a view to pollution forms; politics; environmental legislation in Brazil and in the world.
10. Environmental laws and protocols: Agenda 21; Kyoto protocol; Montreal protocol; environmental legislation; environmental crimes law; national environment policy; Conama resolutions.
11. Principles of environmental management: basic principles; management instruments; management analysis techniques; environmental quality.
12. Environmental management in the company: the company system; the traditional model of the company; the conflict model; the real world model.
13. Certification –ISO 14,000: environmental management system; standard structures; implantation;

certification processes; cleaner production.

14. Environmental risks: risk concepts; history and development of risk assessment and management procedures; risk analysis; the meaning of risk; risk versus benefits; risk classification; risk acceptance.
15. Environmental problems in the semi-arid: climate irregularity; dry; desertification; exodus; hunger and poverty.
16. Technical visit.

15. Workload description				
Number of Weeks:	**Number of Credits:**	**Total Workload in Hours:**	**Theory Workload in Hours:**	**Practice Workload in Hours:**
16	03	48	48	-

16. Basic bibliography:

1- ALMEIDA, J. R.; MELLO, C. dos S. Gestão Ambiental: Planejamento, Avaliação, Implantação, Operação e Verificação. Rio de Janeiro, Thex Ed. , 2000, 259p.

2- ANDRADE, R. B. Gestão Ambiental – Enfoque Estratégico Aplicado ao Desenvolvimento Sustentável. São Paulo, MAKRONBooks, 2000, 206p.

3- BACKER, P. , Gestão Ambiental: A Administração Verde. Rio de Janeiro, Qualitymark Ed., 1995, 248p.

4- BAIRD, C. Química Ambiental. Porto Alegre. Bookman, 2002, 622p.

5- BARBIEI, J. C., Desenvolvimento e Meio Ambiente: As Estratégias de Mudança da Agenda 21. Petrópolis, RJ, Vozes, 1997, 156p.

6- CHEBEBE, J. R. B.Análise do Ciclo de Vida de Produtos – Ferramentas Gerenciais da ISO 9000. Rio de Janeiro, Editora Qualitymark, 1998, 104p.

7- CORSON, H. W. Manual Global de Ecologia. São Paulo, Editora AUGUSTOS, 1996, 413p.

8- DERISIO, J. C. Introdução ao Controle de Poluição Ambiental. São Paulo, 3ª ed. Signus Editora, 2007, 192p.

9- DIAS, M. C. (coord.) Manual de Impactos Ambientais. Fortaleza, Banco do Nordeste, 1999, 250p. 2000, 259p.

10- MAIMON, D. Passaporte Verde: Gestão Ambiental e Competitividade. Rio de Janeiro. Qualitymark ED., 1996, 11p.

11- MOTA, S., Introdução à Engenharia Ambiental. Fortaleza, Edições UFC, 4ª Ed. 2006, 388p.

12- PHILIPPI JR., A. Saneamento, Saúde e Ambiente: Fundamentos para um Desenvolvimento Sustentável. Barueri. Ed. Manole. 2005, 842p.

13- VALLE, C. E. Como se Preparar para as Normas ISO 14000: Qualidade Ambiental. São Paulo, Pioneira, 1995, 127p.

14- VITERBO, J. E. Sistema Integrado de Gestão Ambiental: Como implementar um sistema de gestão que atenda às normas ISO 14001, a partir de um sistema baseado na norma ISO 9000. São Paulo, Ed. Aquariana, 1998, 224p.

17. Complementary bibliography:

1- Resolução 001 - CONAMA.

2- Agenda 21.

3- Lei de Crimes Ambientais.

4- ABNT, coletânea de Normas ISO 14000, Rio de Janeiro, Ed. PETROBRÁS, 1998.

5- BRASIL. Conselho Nacional do Meio Ambiente. Resolução CONAMA nº 357 de 17 de março de 2005. (Publicado no D. O. U. de 18 de março de 2005). Brasília, 2005.

6- Legislação Ambiental Federal – Legislação Ambiental Estadual.