«APPROVED»
Head of Ecology
and Basic Safety Department
_____Romanenko S.V.
« _____» _____ 2014

ANNOTATION OF DISCIPLINE

1. DISCIPLINE **ECOLOGY**

2. DISCIPLINE CODE **Б.2.Б.2**

3. STUDY MAJOR **Mechanical Engineering**

4. PROFILE -

5. QUALIFICATION (DEGREE) **Bachelor**

6. DEPARTMENT **Ecology and Basic Safety**

7. LECTURER **Nazarenko O.B.**
tel. **563-784** *E-mail* olganaz@tpu.ru

8. COURSE OBJECTIVES

- the formation of students' of ecological worldview and the ability to use environmental laws and principles for making the design decisions in their professional activities.

9. STUDENTS LEARNING OUTCOMES

№	Result
RD1	Knowledge of the problems of the world civilization interaction with nature and the ways of their reasonable solution
RD2	Knowledge of the basic mechanisms of the functioning of the biosphere
RD3	The application of ecological principles of nature protection and environmental management
RD4	Knowledge of the basics of human ecology
RD5	Knowledge of global and local environmental problems, types of protective equipment and technology
RD6	Knowledge of organizational and legal means to protect the environment
RD7	Using the basic laws of ecology in professional activities
RD8	The ability to choose the technical means and technologies, taking into account the environmental impacts of their use
RD9	Predicting the consequences of their professional activities in terms of biospheric processes

RD10	Knowledge of methods of choosing the rational way to reduce the impact on environment in the professional activity

10. COURSE STRUCTURE

The name of the unit	Total contact hours		Self-Study Hours	Total Hours
	Lectures	Practical classes		
1. Introduction. The problems of interaction between society and nature	2	2	4	8
2. Biosphere	2	2	4	8
3. Organisms and environment	2	2	4	8
4. Ecosystems	2	2	4	8
5. Human populations	2	2	6	10
6. Natural resources and associated problems	2	2	6	10
7. Atmospheric pollution	2	2	6	10
8. Water pollution. Solid waste	2	2	6	10
Total	16	16	40	72

11. YEAR___**1**____ SEMESTER __**1**_____ CREDITS __**2**___

12. PREREQUISITES _____None_____
13. COREQUISITES _____None_____

14. FORMS OF STUDY (ЛЕКЦИИ, ЛАБОРАТОРНАЯ РАБОТА, ПРАКТИЧЕСКИЕ ЗАНЯТИЯ И Т. Д.) И ВРЕМЕННОЙ РЕСУРС:
____lectures_____ __10__ час.
____practical classes_____ __26__ час.
CLASS HOURS __36__ час.
SELF-STUDY __36__ час.
TOTAL __72__ час.

15. LABORATORY WORKS – None

16. COURSE PROJECTS – None

17. INDIVIDUAL WORKS
Topics of scientific review:

1. History of science "Ecology"
2. Biogeochemical cycles: carbon, nitrogen, oxygen
3. Demographic problems of the Earth
4. Problem of food product
5. Ecological consequences of forest fires

6. Fertilizers: benefits and harms
7. Ozone hole. Solutions to the problem
8. Acid rains
9. International agreements: Kyoto Protocol, Montreal Protocol
10. Global warming
11. Smog: formation and composition
12. Ecological problems of automobiles
13. Recycling
14. Low-waste technologies
15. Biotechnological processes in water treatment
16. Nuclear power engineering and the environment
17. Hydropower engineering and the environment
18. Thermal engineering and the environment
19. Alternative energy sources
20. Environmental consequences of industrial accidents

18. FINAL ASSESSMENT

_____Final test_____

19. REFERENCES

Basic

1. Fundamentals of Ecology / E.P. Odum, G. Barrett. 5th ed. Belmont: Brooks/Cole, 2005. 598 p
2. Encyclopedia of Environmental Science and Engineering / ed. J.R. Pfafflina, E.N. Zieglera. 5th ed. New York: Taylor & Francis, 2006.
3. Industrial ecology: Environmental Chemictry and Hazardous Waste / S.E. Manahan. Boca Raton: Lewis Publishers, 1999. 318 p
4. Ecology: from individuals to ecosystems / M. Begon, C.R. Townsend, J. L. Harper. 4th ed. Oxford: Blackwell Publishing. 2006. 754 p.
5. Ecological engineering: principles and practice / P. Kangas. Taylor & Francis e-Library, 2005. 452 p.

1. Additional

6. A Dictionary of Ecology: Over 5 000 entries / ed. M. Allaby. 2nd ed. New York: Oxford University Press, 2004. 440 p.
7. Restoration Ecology and Sustainable Development / K.M. Urbanska, N.R. Webb, P.J. Edwards. New York: Cambridge University Press, 2000. 397 p.
8. Restoration Ecology. The New Frontier / ed. J. Andel van, J. Aronson. 2nd ed. Chichester: Wiley-Blackwell, 2012. 381 p.

20. LECTURER

Nazarenko O.B., professor, 563-784

Author _____**Nazarenko O.B.**_____