

# **The ecological crisis and the problems of modern civilization**

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# requirements of the course

- My course is 2 credits. One lecture and one seminar. On the credit system you must get a maximum of 100 points
- 1 and 2 midterm you will get 60 points. Each midterm is 30 points. Your final is 40 points.
- 1 midterm is on the 7<sup>th</sup> week. 2 midterm is on the 14<sup>th</sup> week

## **1 midterm**

- Each seminar is 4 points. Each individual work is 5 points.  
Attendance of each lecture is 1 points. For first midterm you will have a test. Consisting of 20 questions. Maximum points is 10 points. All is 30 points.

## **2 midterm**

- Each seminar is 4 points. Each individual task is 2 points.  
Attendance of each lecture is 1 points.





## Definition

***Ecology is the study of the relationships of organisms with other organisms and with their physical environment. Ecology also includes study of the structure and functions of natural systems. The word ecology was first used in 1866 by the German biologist Ernst Haeckel (1834–1919), who based it on the Greek words oikos, meaning "household," and logos, meaning "study."***

# ЭКОЛОГИЯ

**Primary objectives of the science of ecology are as follows:**

- 1. To study change in organisms population;**
- 2. To study energy flows through the living systems, and circuit of substance involving living organisms.**

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3. To develop a scientific basis for exploiting the biological resources;
4. To develop measures to ensure minimum use of chemical agents to control *organisms* considered *harmful*;

4. To control the population of living organisms;
5. To provide indication of environmental status and contamination of natural habitats.

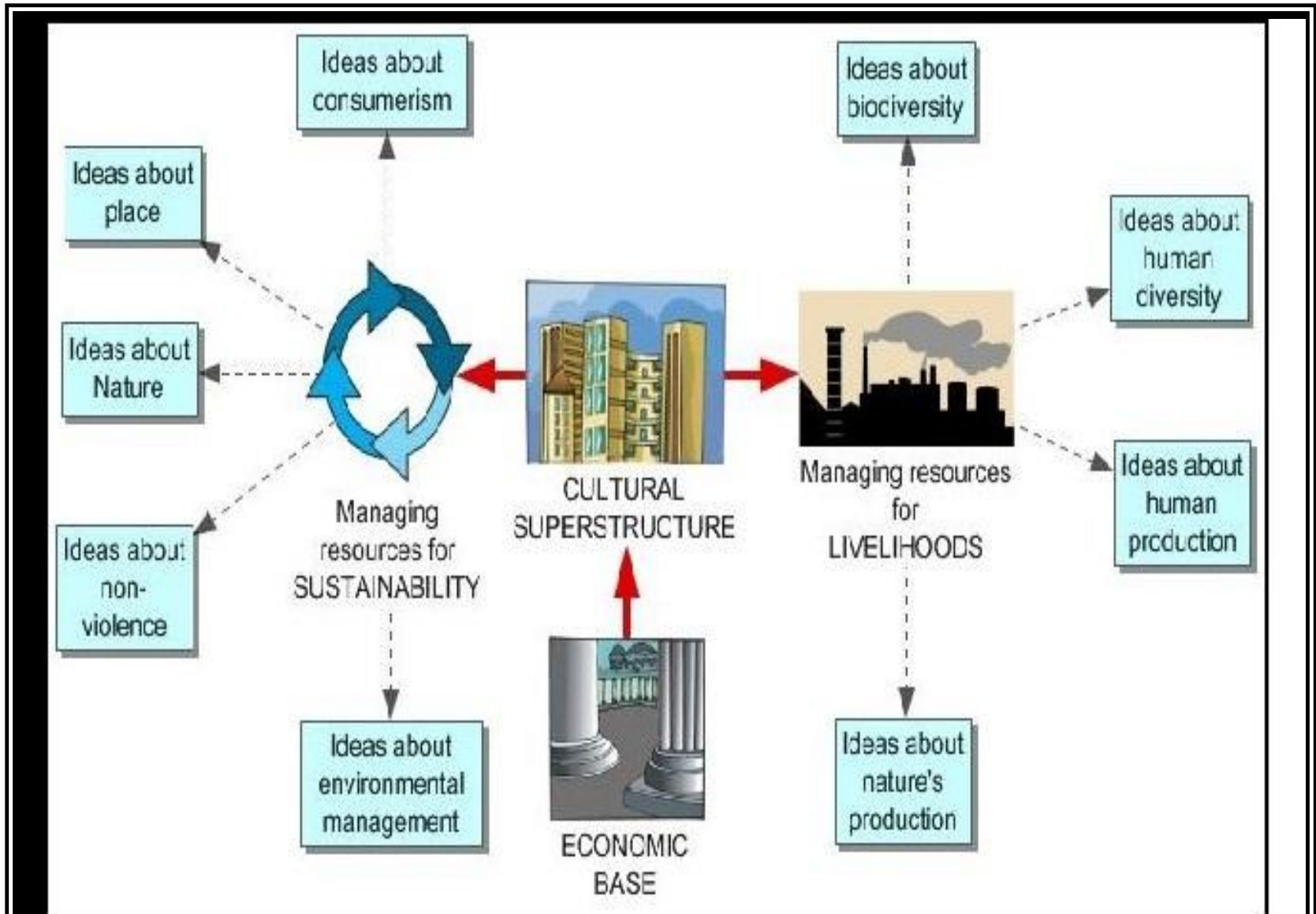
All of the above mentioned objectives are focused on sustaining the biological diversity being a key factor of sustainable nature and society development

# Structure of modern ecology

Modern ecology relies heavily on experiments, both in laboratory and in field settings. These techniques have proved useful in testing ecological theories, and in arriving at practical decisions concerning the management of natural resources.



# Structure of modern ecology





# The relationship of ecology with other sciences

- Ecology is a multi-disciplinary science, drawing on many other branches of science
- Applied ecology is the practice of employing ecological principles and understanding to solve real world problems. E.g. calculating fish population, measuring environmental impact from construction or logging, building a case for the conservation of a species, and determining the most effective way to protect a species

# Sections of ecology

*The science of Ecology is closely related with both natural and human sciences (chemistry, mathematics, physics, geography, medicine, economics, law, etc.).*





# ***Biological Ecology***

***Biological Ecology*** studies the *conditions of existence of living organisms* and the relationship between organisms and ecological environment they are inhabiting in.





# Autecology

**Autecology** studies such characteristics of the living organisms as adaptation to temperature, humidity, salinity and other environmental factors, as well as growth and reproduction, lifetime, growth rate, and also metabolism characteristics - composition and quantity of food, respiration rate, and photosynthetic rate.





# *Population Ecology*

***Population Ecology or Demecology*** studies characteristics of the population consisting of species varying in quality, age, sex, and phenotype.



# *Sinecology*

*Sinecology or Community Ecology* studies the community species composition, their spatial pattern, and communities change with time.





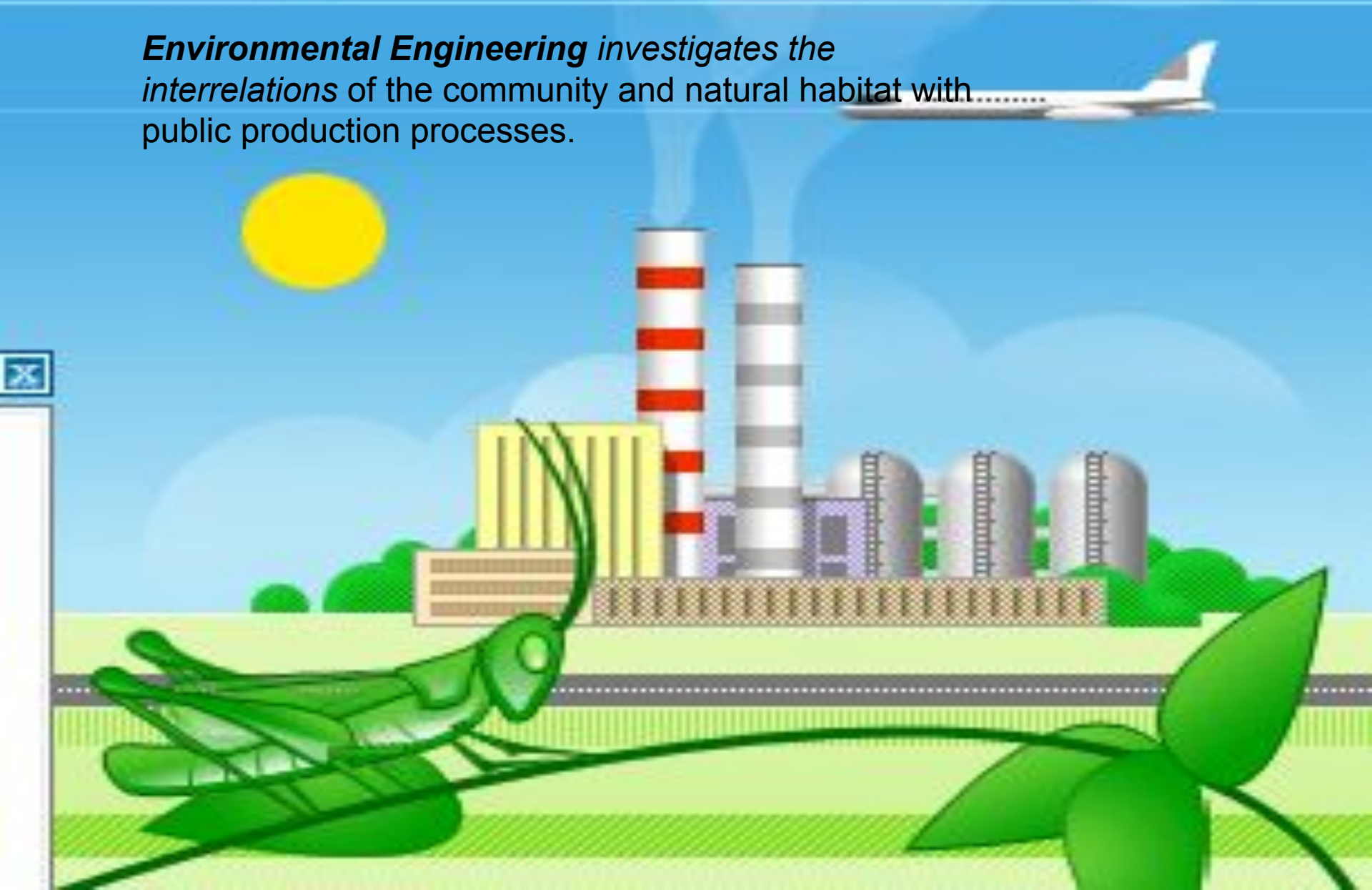
# ***Global Ecology***

Complex of all earth ecosystems within three geospheres (lithosphere, hydrosphere and atmosphere), which interact with living organisms, creates the biosphere - the largest ecosystem on Earth (in Greek: “bios” means life, plus sphere). ***Global Ecology*** studies biosphere as a whole.



# ***Environmental Engineering***

***Environmental Engineering*** investigates the interrelations of the community and natural habitat with..... public production processes.





## ***Human Ecology***

***Human Ecology*** focuses on preservation and improvement of human health, with a glance to the relationship *between* human and his circumambient natural and social environment.





# Social Ecology

**Social Ecology** investigates the *nature-society* interactions; it is the science dealing with radical changes taken place in the technology structure and quality, the economy priorities, value paradigms and modern production culture, aimed at secure strategy and tactics of the human activities in the field of remaking of nature





# *Space Ecology*

***Space Ecology*** being a totally new line of Human Ecology deals with the manned satellites as artificial ecosystems and also studying the impact of the space medium factors on human organism which is being a core of this system.



# Importance of Ecology

- Since all of us live in a natural or partly natural ecosystem, then considerable pleasure can be derived by studying the environment around us.
- Human economies are based on the exploitation and management of nature. Applied ecology is used every day in forestry, fisheries, range management, agriculture, and so on to provide us with the food and fiber we need



# Science ecology

- Importance to human existence.
- Accumulation of ecological knowledge.
- Its environmental effects.
- Its influence in the future.
- Self preservation of the ecosystems.





## Sustainable Development

*Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs*



### Example “Clean Water”

- We need to have it!
- Ways to recycle water.
- Ways to cut back on the usage of water.

# Conclusion

- **Sustainable development in the ecological sector is necessary for the self preservation and future of humankind. If we do not look after our resources and its environment we will be the instigators of the decline of the human race.**
- **There is a movement to correct the mistakes of the past, but are we working fast enough to clean up the mess of the past?**
- **There is an English saying “talk is cheap” Are we just talking about the problem or are we going to come up with the working solutions that will maintain the future**