



BB2015 Miljötoxikologi 7,5 hp

Environmental Toxicology

När kurs inte längre ges har student möjlighet att examineras under ytterligare två läsår.

Fastställande

Kursplan för BB2015 gäller från och med VT19

Betygsskala

A, B, C, D, E, FX, F

Utbildningsnivå

Avancerad nivå

Huvudområden

Bioteknik

Särskild behörighet

Undervisningsspråk

Undervisningsspråk anges i kurstillfällesinformationen i kurs- och programkatalogen.

Lärandemål

After taking this course, the student should be able to:

- Recognize dangerous molecules and what properties make a molecule dangerous.

- Describe how a molecule which is harmless, through metabolism, can be transformed into a molecule which is potentially dangerous.
- Explain that among those natural life processes, there are inherently, potentially dangerous processes/molecules which can be abused if the protection around them is disturbed. For example, the activation of oxygen which results in reactive oxygen compounds like free radicals. The activation of programmed cell death at the wrong time is another example.
- Explain the damages which arise when molecular protection functions and reparations systems become overloaded.
- Explain environmental toxicology in several ways; interference caused by people can make organisms show stress/defensive reactions, which, in turn, leads to the culture of toxic and environmental affecting substances as well as ecological imbalance.
- Point out possibilities to substitute xenobiotics (e.g. biocides) with biological processes/methods. Suggest alternatives and not just disapprove. Recognize how natural protection/defense systems are designed and function in order to, for example, be able to give organisms help to help themselves.
- In a future occupation as an engineer, think critically with one's own knowledge, identify and avoid including environmental toxicology problems in products and processes, but also, in the early stages, identify problems if they come up. The student should possess a bank of facts and scientific language in order to communicate those ideas to the authority and toxicology specialists.

Kursinnehåll

The environmental toxicology course is a broad course, which spans from molecules to ecosystems. The course gives an understanding for how xenobiotics (substances or materials unknown to the cell/organism) can influence humanity and the environment; consequently, animals and plants. The course consists of an application of the bio program's basic chemical and biochemical knowledge in an environmental toxicological context. Water-soluble and fat-soluble are central molecular properties which become significant in a new respect. Heredity is not only the sequence of DNA-bases; but also the power to make use of those sequences that are hereditary, but with another hereditary mechanism (epigenetics), which can be affected by the environment. Important knowledge which is mediated is that organisms' biochemical/physiological control systems are sensitive to xenobiotics, and interferences result in extensive, increasing, and often long-term harmful effects on gene activity, cell differentiation, embryo development, reproduction, and behaviour. The student becomes aware of those connections and develops sensitivity for environmental toxicology problems. An overall goal is that the student in his/her own future occupation as an engineer will avoid including environmental toxicology problems in products and processes, but also, in the early stages, identify problems if they come up.

Literature assignment (report and presentation): In a subject related to the course: search of scientific information, report writing and presentation.

Kurslitteratur

Handouts from lectures and some scientific publications; also some recommended books

Examination

- LIT1 - Litteraturuppgift, 2,5 hp, betygsskala: P, F
- TEN1 - Skriftlig tentamen, 5,0 hp, betygsskala: A, B, C, D, E, FX, F

Examinator beslutar, baserat på rekommendation från KTH:s handläggare av stöd till studenter med funktionsnedsättning, om eventuell anpassad examination för studenter med dokumenterad, varaktig funktionsnedsättning.

Examinator får medge annan examinationsform vid omexamination av enstaka studenter.

Etiskt förhållningssätt

- Vid grupparbete har alla i gruppen ansvar för gruppens arbete.
- Vid examination ska varje student ärligt redovisa hjälp som erhållits och källor som använts.
- Vid muntlig examination ska varje student kunna redogöra för hela uppgiften och hela lösningen.