

KTH SK2712 Environmental Physics, Course PM VT2023

This course covers the physics of solar energy, geophysics, the carbon cycle, carbon-based, nuclear, and renewable energy, the Green-house effect, and how mankind affects the environment. The emphasis is on understanding the relevant physical principles and the ability to apply them to solving simple practical problems. This course is based on courses given at KTH (F) Engineering Physics and at Stockholm University since the 90-ies. It is continuously upgraded with recent research from relevant fields.

Layout

The lectures follow the course book (BvG'2011), with additional material on Geophysics and other topics. 6 home assignments time-aligned with the lectures (with at least 50% passed) and an active participation in the Renewable Energy Workshop will be required to pass the INL1 part (3 hp). Oral exam (TEN1, 4.5 hp) will be graded A through F.

Literature

The course follows the textbook "Environmental Physics, Sustainable Energy and Climate Change", by E. Boeker and R. van Grondelle, Wiley 2011 (3rd edition). The textbook is available as e-text (English) for free for enrolled students (via KTHBib). Detailed lecture notes will be provided in the form of a compendium. Additionally, a compendium based on an earlier edition of the book and a set of practice problems with solutions are available as additional study material. The textbook, study materials and exams are in English; course administration, teacher communication - in English or Swedish.

Exams and grading

The course follows the textbook, with some modifications in the ordering of the topics. The home assignments are subdivided into 6 sections (6 tests), corresponding to the chapters in the textbook. The 6 tests are max 5 points each, giving a max total of 30p, of which 20p will be required for passing INL1 part (3 hp) in addition to an active participation in the Workshop. The oral exam's scale is A-F.

Each test consists of 5 questions/problems from the corresponding chapter/section of the textbook. No new attempts for improving pass-grades A-E (ingen plussning).

The e-test credits are valid only for the current term. In case the final grade is below Pass, the e-test credits expire, and any future re-exams will be for the full 60p.

There are two types of multiple-choice questions throughout all tests, with single and multiple answers allowed. Answering questions with numerical alternatives, choose the one that is the closest to your calculated result, even if your answer and the given alternative do not agree to the very last digit (use rounding).

Note, incorrect answers in "multiple-answers-allowed" questions need to subtract fractional points from the total grade for the given question in order to discourage blind selections of all alternatives, which would automatically give the maximum grade. The net of the correct and incorrect alternatives is zero, e.g., $50\%+50\%-33\%-33\%-33\%=0$. The minimum grade for a given question is zero, i.e., no negative grades and no negative effect on other questions (even if you select only incorrect alternatives).