

FÖRSLAG TILL PROGRAMNÄMND INFÖR ÅR

NÄMND/NÄMNDER:

Förslagsställare (Namn, funktion, Inst/Enhet)

FÖRSLAGET GÄLLER:

a) EXISTERANDE KURS (Ange kurskod och kursnamn)

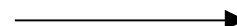
b) NY KURS (Ange kursnamn, årskurs, önskad läsperiod, schemablocksplacering. Bifoga utkast till kursplan.)

c) ÄNDRING I EXISTERANDE PROFIL/INRIKTNING (Ange Program och Profil/Inriktning. Bifoga beskrivning över vad förslaget går ut på.)

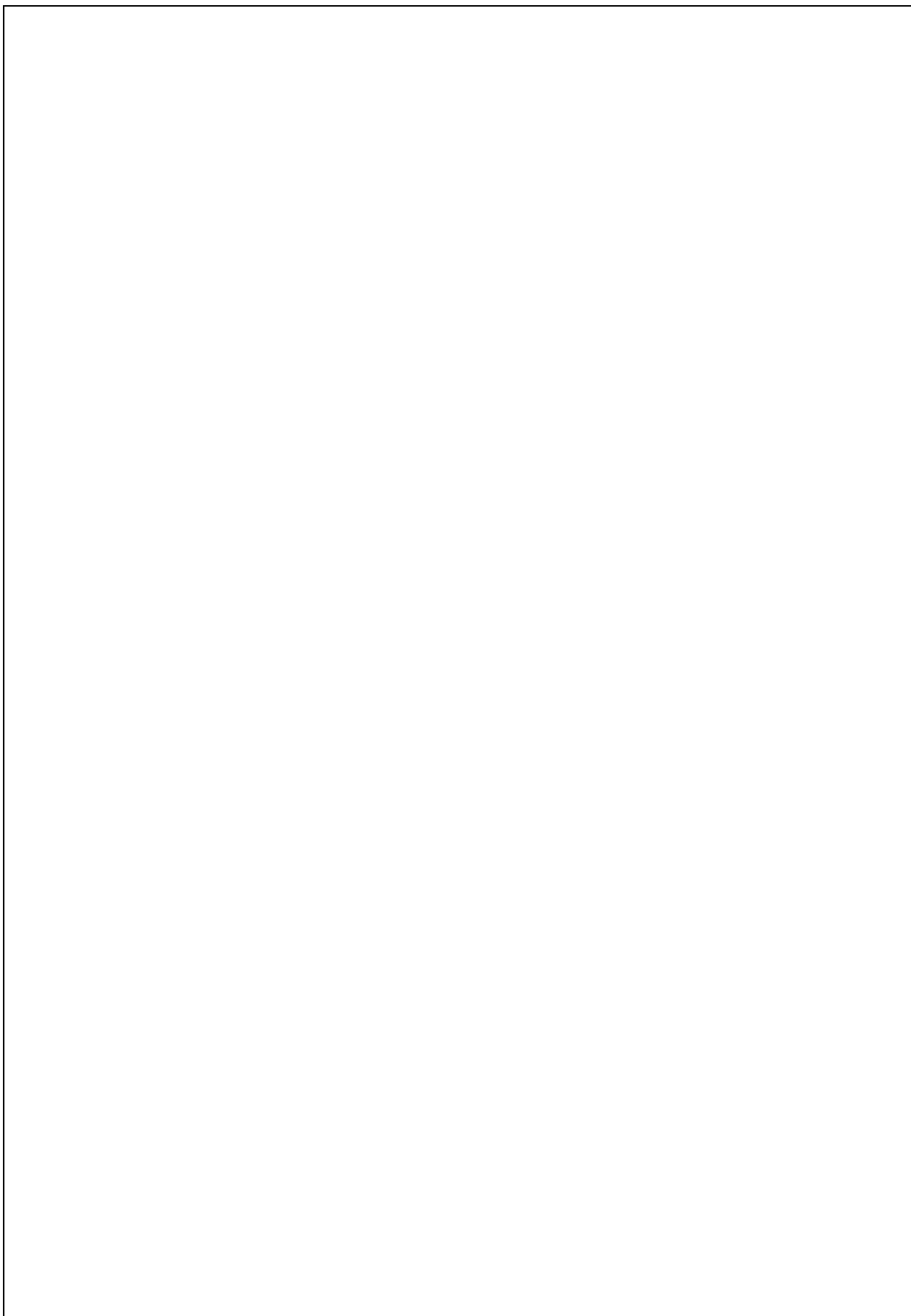
d) NY PROFIL/INRIKTNING (Ange Program och Profilnamn. Bifoga utkast till Profilbeskrivning.)

e) ÖVRIGT (Bifoga beskrivning över vad förslaget går ut på.)

PROGRAMNÄMNDENS BESKED:



FÖRSLAGET I DETALJ:

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Additive manufacturing: tools, materials, and methods, 6 ECTS credits

Prel. Scheduled hours: 40

Rec. self-study hours: 120

Area of Education: Science

Main field of studies: Physics, Applied Physics, Mechanical Engineering, Materials Science

Advancement level: A

Aim:

This course will provide a general understanding of additive manufacturing (3D-printing), and be able to:

- describe various “printing” methods, their advantages and disadvantages,
- choose between the types of materials appropriate for various printing methods,
- understand the physics and chemistry involved with the various printing methods, including the material requirements,
- print 3D objects with a printer from a CAD model, and
- describe current and future applications of additive manufacturing.

Prerequisites: (valid for students admitted to programmes within which the course is offered)

Knowledge of introductory chemistry and physics, basics of computer operation. Students who are concerned about their qualifications are encouraged to contact the examiner.

Organisation:

Instruction will be provided in the form of lectures, laboratory exercises, and visits to industrial sites.

Course content:

- Material properties in the solid, liquid, and other (gel, glass) states
- Phase-change processes and chemical reactions, including photo-initiated chemistry
- Introduction to digital control of mechanical systems (stepper motors, etc.)
- Introduction to fluid mechanics, as applied to additive manufacturing
- Introduction to surface science, as applied to additive manufacturing
- Strengths, weaknesses, and requirements of various applications of additive manufacturing including:
 - Mechanical applications (prototypes, mechanical components)
 - Chemical and life-science applications (prosthetics, artificial organs, lab-on-a-chip devices, etc.)
- An introduction to 3D CAD
- An introduction to planning/slicing software
- Hands-on design, fabrication, and evaluation of fabricated parts

Course literature:

Review articles and notes available for download (password protected) on the course homepage.

Examination:

Written examination – 3 ECTS

Laboratory exercises – 1 ECTS

Industry visit – 0.5 ECTS

Student project & presentations – 1.5 ECTS

Coarse language is English