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RECENT ADVANCES IN DISTANCE EDUCATION FOR PHYSICS STUDENTS

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Overview

- First year, first semester.
- Contents (pre-2011) mechanics, fluids, electricity.
- Contents (post-2011) mechanics, fluids, engineering mechanics.
- 20% assignments, 20% prac, 60% exam.
- Identical assignments and exams for off-campus and on-campus.
- Six three-hour practical exercises.

Off-campus delivery to 2008

- Textbook plus printed study guides and electricity video posted to students.
- Basic website delivering lecture notes, assignment and problem answers, and announcements.
- Assignments paper-based, posted to lecturer, marked, returned in post.
- Communication to students via post, email and telephone.
- Saturday practicals; some limited prac performed at home by small numbers of students.

Recent Innovations

- Course material delivered almost entirely via web-sites.
- Increased demand from students to use multi-media.
- Lectures and tutorials video recorded and posted on-line.
- Enhanced unit web-site.
- Off-campus tutorials delivered via web-conferencing.
- Practicals delivered mostly at Engineering professional practice residential schools (required for accreditation by Engineers Australia).
- Very recently, practicals have been delivered in real-time to small groups via web-conferencing.
- Videos currently being produced to introduce the practicals before the students actually perform them.

Conclusions

- First-year physics has been delivered by distance education for 17 years.
- Off-campus marks are comparable to on-campus marks.
- Relative performance between on-campus and off-campus has been mixed.
- Recent developments include synchronous on-line delivery of tutorials and prac classes.
- The future: "cloud learning" and increased use of videos.
- Possibilities: remote labs, experiment kits.
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ABSTRACT
Distance education has arisen in the past 30 years or so as a way of providing education to students who otherwise do not have access to local tertiary education facilities. This includes students who live in remote areas, students posted overseas, students who lack mobility, and even students who work during the day where suitable evening classes are not available.
Deakin University has been teaching first-year engineering physics to both on-campus and off-campus students since 1996. The unit is part of a Bachelor of Engineering course accredited by Engineers Australia.

This presentation outlines the advances made in delivering education in physics to a wide variety of students in distance mode. Course materials have developed from written study guides to fully on-line teaching materials, complete with streaming video presentation of lecture and tutorial material. Tutorials are delivered to off-campus students by web-conferencing. A very recent development is delivering on-line practical classes the same way. Challenges and how they were overcome will be discussed, along with how modern educational technologies have been employed.