

## Project Description:

# Electronic Payments

### Application Scenario

Assume that DTU wishes to introduce a new smart card to replace magnetic stripe cards for access and payments everywhere on the DTU campus. The payment system must support both debit/credit card style transactions for larger payments e.g. in the canteen or the book store, and smaller (micro-)payments e.g. when using photo copiers, printers, expensive laboratory equipment, etc.

The payment system outlined above operates with a single currency, the *DTUnit*. However, in order to replenish their smart cards, students must be allowed to transfer funds to the card, i.e., some mechanism for converting between Danish Kroner and DTUnits must be developed. Moreover, the exchange rate must be set so that it accommodates both traditional payments and the proposed applications of micropayments. It is also possible to introduce multiple currencies in the payment system, which would allow the card to provide access to rooms and building outside the general access area, where only authorized personnel will be issued with the relevant currency.



### Project Definition

Design, evaluate and document a payment system which addresses the issues raised above. Issues that *must* be addressed are:

- Risk analysis: What assets are at stake for different users of the service? In particular, do not forget the (often overlooked) issue of privacy.
- Threat model: What assumptions do you make about the attacker, and what threats is your system supposed to protect against?
- Usability: If the system is hard to use, it will not become popular. Thus, it is important that you find a solution that the average student will not find too difficult.
- Security: Make sure that your system protects against the security issues raised in the threat model, and clearly document the threats that you do not protect against.