#### Pedagogic case and specific course in which designed tasks and units are used

**Name of university: UCM**

**Contact person: Adrián Riesco (ariesco@ucm.es)**

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| Pedagogic case: | * Teaching formal specification in rewriting logic * Teaching formal verification with Linear Temporal Logic via model checking. * The course is aimed to Master's students in Computer Science. |
| Description (including temporal scheme for design, development and implementation) | * Rewriting logic is a logic of change, where transitions are described with rules. Verification in these systems is done by analyzing the corresponding automata generated by applying rules in a non-deterministic way. * The automata of these systems stands for the state space of many different games, so the idea is to introduce the system with simple games: inquire will be used in programming assignments for students. |
| Aim of pedagogic case | * To reflect on how to use games to teach mathematical concepts to non-mathematicians. |
| Mathematical concepts | * Rewriting logic. * Linear Temporal Logic. |
| Addressed practice | * Master's course on Computer Science. First semester |
| Place in specific course Course name  Place of units | * One semester course. * Auditory and Quality Assurance. * Unrelated with other subjects; the Master's course gives a wide description of several topics but details are explored in the Master's Thesis only. |
| Learners profile orientation, year,  age, prior knowledge,  other such as math anxiety, special needs, .. | * Approximately 23 years old. * Degree in Computer Science. * Around 25 students. |
| Organisation of specific course study credits/hours,  location, group size | * 60 hours. 4 hours per week; 15 weeks. * The case focuses on part of the subject, around 20 hours. * Each week the teacher presents the concepts for 2 hours (Wednesday) and the students work under the supervision of the teacher for 2 hours (Friday). |
| Expected learning outcomes | * Students are able to specify and verify simple but real systems. |
| Envisioned use of digital technology | * Completely; students use Maude, a specification language, to code their assignments. |
| Planning of tasks | * Discussion with other teachers involved in specification of systems. * Related work - Maude book. * Design of programming examples and assignments. * Concepts and syntax are taught via games. * First assignments are games as well; final assignments are a more complex version of these games. * 1st assignment - Discussion in large groups (the whole class under the teacher supervision). * 2nd and 3rd assignments - Discussion in small groups. * 4th and 5th assignments - Discussion in groups of at most 2 students. Graded. * Wednesdays are used to introduce new example and discuss those problems that students could not solve on Friday. * Study how well theoretical ideas are coded. * Discussion of results. |
| Names of persons involved | * Adrián Riesco |
| Course: | Master Course in Computer Science |
| Learning objectives | On completion of this module, students should be able to:  **Knowledge and Understanding**  - Specify average transition systems.  - Verify these systems. **Subject-specific Skills**  - Equational and rewriting logic.  - Model checking. **Transferable Skills**  - graph theory;  - declarative programming. |
| Learning contents | * Membership equational logic - Maude functional modules. * Rewriting logic - Maude system modules. * Modal logic. * Model checking - Maude MODEL-CHECKER module. * Partial order reduction. |
| teaching /learning activities | * Programming assignments. * Programming examples via games. |
| Media | * Maude |
| Evaluation | * Correctness of ideas. * Correctness of code. |
| **Instructor role** | * On Wednesday he/she presents the basic ideas and helps students with those problems they could not solve. * On Friday he/she first leads discussions. in large gropus Then he/she helps in smaller groups. |
| **Student roles** | * Engage in assignments. In lectures they propose ideas but the teacher leads. |