

European Master Program Embedded Computing Systems



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Motivation

- Universities can only be as good as their students
- Internationalization is key for university excellence
- Growing importance of strategic partnerships with universities in Europe and third countries

Embedded Systems

- An “*embedded computing system*”, or simply “*embedded system*”, is a complex computer system which is specialized for certain applications in a particular technical environment.
- More than 90% of the processors sold on the global market are for embedded applications
- Example: embedded systems in modern middle class car:

- 70 processors
- 10 million lines of software code
- 40 % of the value



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Criterion: Course Content (25%)

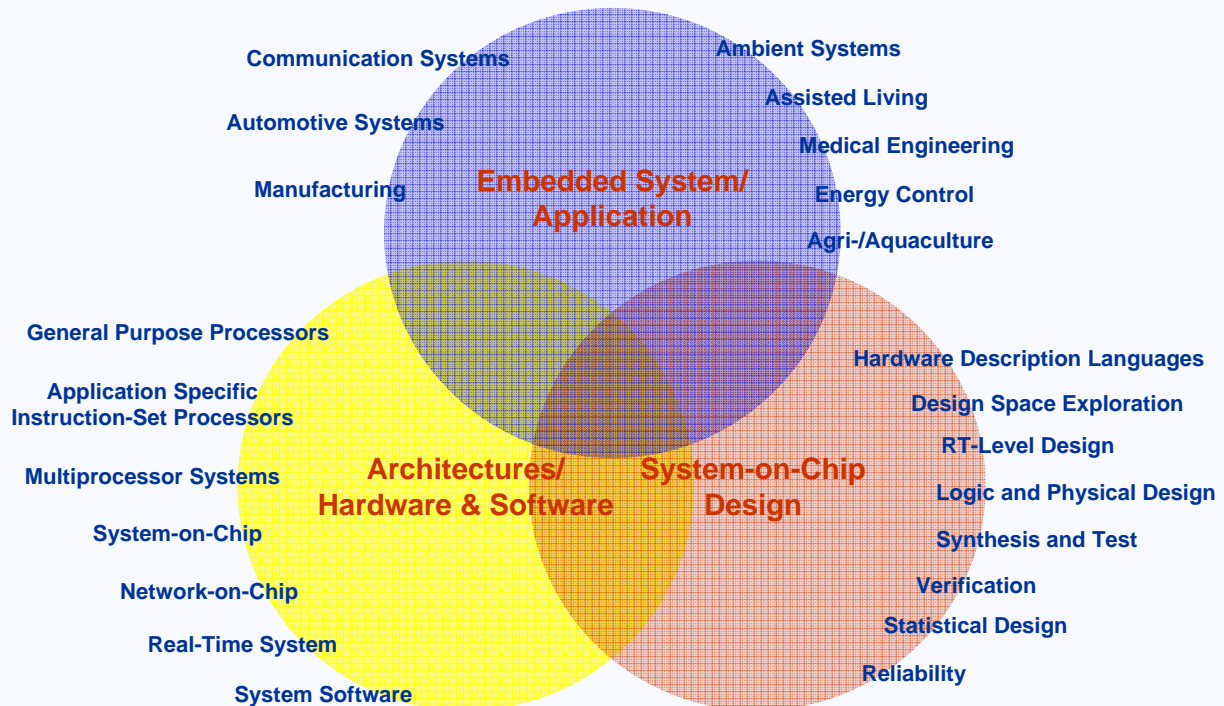
Needs Analysis

- Relevance of topic for European and global economy
 - Describe role of embedded systems as strategic factor for Europe’s economy
 - Provide documentation: “Zukunft Digitale Wirtschaft” by Roland Berger Consultants
- Relevance of topic for “educational market”
 - Describe relevance of topic for prospective students
 - Possible links on “DAAD Länderstudien”

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Criterion: Course Content (25%)

Embedded Systems „Teaching Space“

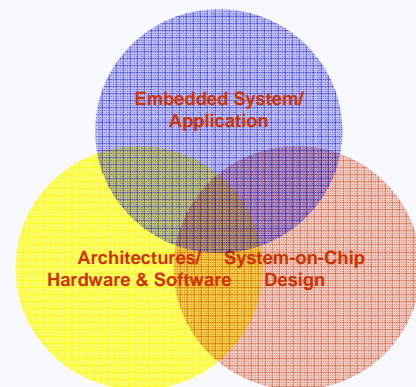


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Criterion: Course Content (25%)

Added Value

- Huge teaching space
- Collaboration of partners in joint projects (master's thesis, student project)
- Heterogeneous teaching space
- Partners are active in complementing „habitats“ of Embedded System education and research
- Students benefit from being exposed to several such “habitats”



„Habitat“: environment characterized by specific application domain (e.g. Telecom or Automotive), industrial partners with specific profiles, research specializations, specialized educational offers

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Criterion: Course Content (25%)

Academic Quality – Profile of partner institutions and staff

- Rankings
- Awards
- Grants / Funding
- European Networks of Excellence
- Special successes and activities
- ...

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Criterion: Course Content (25%)

Academic Quality – Programme Structure

Core programme 45 ECTS

- ES Hardware Architectures
- System Software
- SoC Design Methodology

Elective programme 45 ECTS

- Advanced Topics in Embedded Systems
- Communication & Signal Processing
- Automation & Control
- Microsystems

Master's thesis 30 ECTS

Total 120 ECTS

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Criterion: Course Content (25%)

Academic Quality – Programme Structure

Core Programme

- Partners agree on core teaching areas to be covered
 - Can be completed at each partner within one year of study
- ⇒ enables *student mobility*

Elective Programme

- Partners agree on elective teaching areas
 - Reflects the profile and strength of each partner university
- ⇒ adds value to *student mobility*



Teaching areas and specific courses contributing to teaching areas are described in proposal appendix

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Criterion: Course Content (25%)

Academic Quality – Added value

Mobility Scheme

Every student chooses two institutions and spends one year at each.

“Habitats”

- Define study tracks that are orthogonal to teaching areas
 - System-on-Chip Design Track
 - Analog and Mixed Signal Track
 - Reliable Systems Track
 - Real-Time Systems Track
- Tracks concentrate on certain issues but from different view points
- Training for employment in a heterogeneous field

Joint educational offers

- Embedded System Day
- Connect Lectures
- Projects

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Criterion: Course Integration (25%)

Truly integrated....

Starting point: list of joint activities and informal collaborations prior to the proposal

Formal integration

- Jointly developed core programme
- Agreement on elective programme
- Use of ECTS system
- Mutual recognition of credits earned within consortium
- Joint supervision by two advisors, one from each institution involved
- Provide a detailed list of admission requirement agreed by all partners

Joint Educational Offers

- Embedded System Day
- Connect Lectures
- Joint projects

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Criterion: Course Integration (25%)

Degree Awarded: double degree or joint degree?

Joint Degree

- More difficult to implement
- ...but more appropriate within the overall Erasmus Mundus spirit
- Provide documentation of legal permission to implement this (e.g. university law)
- Sketch path to implement the joint degree
- Provide draft of diploma supplement
- Get the strongest possible commitments from your partners

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Criterion: Course Integration (25%)

Financial Management

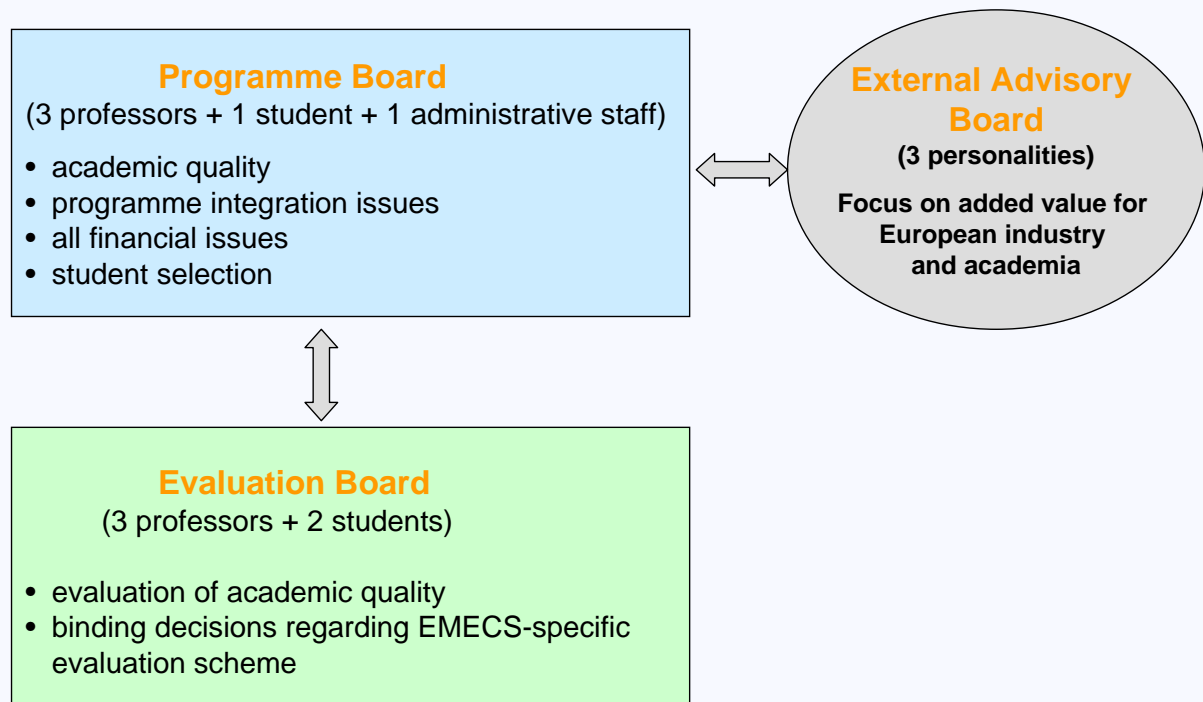
Budget

- Participation costs independent of mobility scheme
- Erasmus Mundus students are not charged more than regular students
- Balanced distribution of budget within consortium
- But: different tuition practices within the consortium
- ... one of our headaches!

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Criterion: Course Management (20%)

Committees



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Criterion: Course Management (20%)

Promotion

- General course marketing
- Recruiting through partnerships
 - describe joint activities with third country universities
- Recruiting through Alumni

Sustainability

- Teaching and research collaborations may continue when funding terminates
- Industry-sponsored master-level education:
 - Lack of excellent students with intercultural communication in emerging economies
 - Trade visibility of companies within consortium with sponsorship

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Criterion: Student Services (20%)

Status of internationalization and services provided

- Individual Information, advice and pre-departure communication
- Welcome services and accommodation
- Support in administrative and organizational issues
- Orientation Course
- Social tutoring
- Family services
- Extra-curricular activities
- Career services
- ...

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Criterion: Quality Assurance (15%)

EMECS Evaluation Board

- monitors the *partner-specific evaluation* practices (see below) within the consortium and analyze them with respect to their implications for EMECS
- set up and make binding decisions on an additional *EMECS-specific evaluation* scheme to assess the added value of student mobility
- checks the availability of courses and adequacy of course contents in all study tracks to reach the formulated educational goals
- monitors the quality of EMECS-specific educational offers
- address problems related to recognition of credits within the consortium and report them to the Program Board
- develop improvements on the curriculum and propose this to the Program Board

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Viel Erfolg !!

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