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|------------------------------------------------------|-----------------------------|-------------------------------------------------|-----------------------------------|
| <b>Name of Module:</b><br>Embedded Operating Systems |                             | <b>CP (ECTS):</b><br>6                          | <b>Short Name:</b><br>MINF-SE-EOS |
| <b>Person Responsible for Module:</b> Heiss          | <b>Secretariat:</b><br>EN 6 | <b>e-mail address:</b><br>heiss@cs.tu-berlin.de |                                   |
| <b>1. Module Description</b>                         |                             |                                                 |                                   |

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| <b>1. Qualification Aims</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <p>Students who have successfully finished this module have an advanced knowledge of operating systems for embedded systems. They are aware of the specific design aspects like realtime behavior, energy consumption, schedulability and fault tolerance and know of their interdependencies. They also have acquired practical training in low level programming of a specific embedded processor.</p> <p>The course is <b>principally</b> designed to impart<br/> technical skills <b>50 %</b>, method skills <b>40 %</b> system skills <b>10 %</b> social skills <b>0 %</b></p> |

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| <b>2. Content</b>                                                                                                                                                                                                                                                                                                                                                   |
| <p><b>Embedded OS:</b> Requirements for embedded systems; example application areas; embedded processor architecture; realtime scheduling; worst case execution time estimation, schedulability analysis;<br/> <b>Dependable Systems:</b> Basic notions and quantities, failure models, fault trees, availability analysis for composition, Byzantine protocols</p> |

| <b>3. Module Components</b> |             |                           |                         |                                          |                    |
|-----------------------------|-------------|---------------------------|-------------------------|------------------------------------------|--------------------|
| Course Name                 | Course type | Weekly hours per semester | CPs (according to ECTS) | Compulsory(C) / Compulsory Elective (CE) | Semester (WS / SS) |
| Embedded Operating Systems  | L           | 2                         | 3                       | C                                        | SS                 |
| Dependable Systems          | L           | 2                         | 3                       | C                                        | WS                 |
|                             |             |                           |                         |                                          |                    |
|                             |             |                           |                         |                                          |                    |

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| <b>4. Description of Teaching and Learning Methods</b>                                                                                                                                                         |
| The lecture conveys the material in traditional form. The tutorial encompasses interactive discussion of issues related to the lecture material. Students may present results of their assignments (homework). |

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| <b>5. Prerequisites for Participation</b>                                             |
| Basic (undergraduate) course on operating systems is required to follow the lectures. |

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| <b>6. Target Group of Module</b>                             |
| Master students of Computer Science and Computer Engineering |

| 7. Work Requirements and Credit Points |                    |       |
|----------------------------------------|--------------------|-------|
| Course Type                            | Calculation Factor | Hours |
| Presence in lectures                   | 3*15               | 45    |
| Presence in tutorials                  | 1*15               | 15    |
| Pre- and postpreparation of classes    | 2*15               | 30    |
| assignments                            |                    | 60    |
| Exam preparation                       |                    | 30    |
|                                        |                    |       |

| 8. Module Examination and Grading Procedures |
|----------------------------------------------|
| Oral examination                             |

| 9. Duration of Module |
|-----------------------|
| 2 semester            |

| 10. Number of Participants |
|----------------------------|
|                            |

| 11. Enrolment Procedures                                                                        |
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| See homepage of module at <a href="http://www.kbs.tu-berlin.de">http://www.kbs.tu-berlin.de</a> |

| 12. Recommended Reading, Lecture Notes                                                                                     |
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| Lecture notes available in paper form?      yes <input type="checkbox"/> no <input checked="" type="checkbox"/>            |
| If yes, where can they be purchased?                                                                                       |
| Lecture notes in paper form are sometimes made available during class.                                                     |
| Lecture notes available in electronic form?      yes <input checked="" type="checkbox"/> no <input type="checkbox"/>       |
| If yes, please specify web address: <a href="http://kbs.tu-berlin.de">http://kbs.tu-berlin.de</a>                          |
| <br><b>Recommended Reading:</b>                                                                                            |
| T. Anderson, P.A. Lee: <i>Fault Tolerance – Principles and Practice</i> , Prentice Hall, 1982                              |
| D.K. Pradhan (Hrsg.): <i>Fault Tolerant Computer Systems</i> , Prentice Hall, 1996                                         |
| D.P. Siewiorek, R.S. Swarz: <i>The Theory and Practice of Reliable Systems Design</i> , Digital Press, 1995                |
| C.M. Krishna, K.G. Shin, <i>Real-Time Systems</i> , McGraw-Hill, 1997                                                      |
| Jane W. S. Lui, <i>Real-Time Systems</i> , Prentice Hall, 2000                                                             |
| Tanenbaum, A.; Woodhull, A.: <i>Operating Systems Design and Implementation</i> , 3 <sup>rd</sup> ed., Prentice Hall, 2006 |
| Stallings, W.: <i>Operating Systems</i> , 5th ed., Prentice Hall, 2004                                                     |

| 13. Other Information |
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