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|---|--|------------------------------------|---|--|---|
| Studiengang: <b>Master of Science Maschinenbau</b><br>Program: <i>Master of Science in Mechanical Engineering</i> |  |                                    |   |  |  |
| 1   | Modul: <b>Prototyping and Virtual Reality (VR)</b><br>Module: <i>Prototyping und Virtual Reality (VR)</i>  |                                    |   |  | <b>English</b><br><i>Englisch</i>   |
|   |  | <b>Semester</b><br><i>Semester</i> | <b>Dauer</b><br><i>Duration</i>                                 | <b>Status</b><br><i>Status</i>                               | <b>Turnus</b><br><i>Regular cycle</i>   |
|   |  | 2. Semester                        | 1 Semester  | elective   | annual  |
|   | <b>Kreditpunkte</b><br><i>Credits</i>  | <b>Aufwand</b><br><i>Workload</i>  | <b>Kontaktzeit</b><br><i>Contact-hours</i>                      | <b>Selbststudium</b><br><i>Student's efforts</i>             |   |
|   | 5 ECTS   | 150h                               | 2hrs/week = 30hrs<br>lecture<br>2hrs/week = 30hrs<br>laboratory | 30hrs Preparation and<br>post processing<br>60hrs Self-study |   |
| 2   | <b>Beschreibung</b><br><i>Description</i><br>Physical and virtual prototypes are used in different fields of R&D to verify the functionality or design of a product. Especially Virtual prototypes helps engineers to develop a product fast and effective although it's not physical exists. With additive manufacturing techniques the product can be manufactured in the same material as a production model. |                                    |   |  |   |
| 3   | <b>Lernziele</b><br><i>Learning Outcomes</i><br><ul style="list-style-type: none"> <li>• Students know virtual engineering with different objectives and software-packages.</li> <li>• Students get experience in modelling and simulation of a product in a multi body system.</li> <li>• Students are aware of the opportunities and limits of additive manufacturing process.</li> </ul>                      |                                    |   |  |   |
| 4   | <b>Schlüsselqualifikationen</b><br><i>Key qualifications</i>   |                                    |   |  |   |
|   | Sozialkompetenz  | Methodenkompetenz                  | Selbstkompetenz /<br>Personenkompetenz                          | Interkulturelle<br>Kompetenz                                 | Medienkompetenz   |
|   |  | X                                  | X   |  | X   |
| 5   | <b>Lehrveranstaltung/ -methoden</b><br><i>Course type and methods</i><br><b>Lecture</b> <ul style="list-style-type: none"> <li>• Seminar-like teaching</li> <li>• Exercises and examples (case studies)</li> </ul> <b>Exercise/ Project/ Laboratory</b> <ul style="list-style-type: none"> <li>• Work in different laboratories</li> </ul>   |                                    |   |  |   |
| 6   | <b>Vorbedingungen / Vorkenntnisse</b><br><i>Prerequisites</i><br><ul style="list-style-type: none"> <li>• Profound knowledge about CAD and CAE principles</li> </ul>   |                                    |   |  |   |
| 7   | <b>Arbeitsmittel / Literatur</b><br><i>Required material / Literature</i><br><ul style="list-style-type: none"> <li>• Hand-outs to lecture and to exercises</li> <li>• Literature according to the current list distributed in the class</li> <li>• Computer software in the laboratory</li> </ul>   |                                    |   |  |   |

| Detailinformationen            |  |                       |                            |            |                                  |         |                                |                         |                       |                            |            |                                  |         |     |   |   |   |     |  |  |
|--------------------------------|--|-----------------------|----------------------------|------------|----------------------------------|---------|--------------------------------|-------------------------|-----------------------|----------------------------|------------|----------------------------------|---------|-----|---|---|---|-----|--|--|
| 8                              | <b>Inhalte</b><br><i>Course topics</i><br><b>Introduction into the topics</b><br><b>Virtual product development</b><br>Virtual products<br>Material, texture, lights<br><b>Kinematics of Rigid Bodies</b><br><b>Additive Manufacturing</b><br><b>Multibody System</b><br>Modelling   |                       |                            |            |                                  |         |                                |                         |                       |                            |            |                                  |         |     |   |   |   |     |  |  |
| 9                              | <b>Prüfungsform</b><br><i>Assessment</i><br>Prüfungsvorleistung / Prerequisite: none<br>Fachprüfung / Examination: project study with documentation, presentation and oral interview   |                       |                            |            |                                  |         |                                |                         |                       |                            |            |                                  |         |     |   |   |   |     |  |  |
| 10                             | <b>Voraussetzung für die Vergabe von Kreditpunkten</b><br><i>Requirements for granting of credits</i><br>Successfully passing all individual parts of the examination according to row 9 „Assessment“.   |                       |                            |            |                                  |         |                                |                         |                       |                            |            |                                  |         |     |   |   |   |     |  |  |
| 11                             | <b>Weiterführende Veranstaltungen</b><br><i>Related courses</i>  |                       |                            |            |                                  |         |                                |                         |                       |                            |            |                                  |         |     |   |   |   |     |  |  |
| 12                             | <b>Zuordnung</b><br><i>Classification</i> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 14.28%;">Mathematik &amp; Naturwissenschaft</th> <th style="width: 14.28%;">Ingenieurwissenschaften</th> <th style="width: 14.28%;">Ingenieur-anwendungen</th> <th style="width: 14.28%;">Entwicklung &amp; Konstruktion</th> <th style="width: 14.28%;">Werkstoffe</th> <th style="width: 14.28%;">Wirtschaft, Management, Sprachen</th> <th style="width: 14.28%;">Anderes</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">(X)</td> <td style="text-align: center;">X</td> <td style="text-align: center;">X</td> <td style="text-align: center;">X</td> <td style="text-align: center;">(X)</td> <td></td> <td></td> </tr> </tbody> </table> |                       |                            |            |                                  |         | Mathematik & Naturwissenschaft | Ingenieurwissenschaften | Ingenieur-anwendungen | Entwicklung & Konstruktion | Werkstoffe | Wirtschaft, Management, Sprachen | Anderes | (X) | X | X | X | (X) |  |  |
| Mathematik & Naturwissenschaft | Ingenieurwissenschaften  | Ingenieur-anwendungen | Entwicklung & Konstruktion | Werkstoffe | Wirtschaft, Management, Sprachen | Anderes |                                |                         |                       |                            |            |                                  |         |     |   |   |   |     |  |  |
| (X)                            | X  | X                     | X                          | (X)        |                                  |         |                                |                         |                       |                            |            |                                  |         |     |   |   |   |     |  |  |
| 13                             | <b>Modulbeauftragter / Lehrpersonen</b><br><i>Responsible person / Lecturers</i><br>Prof. Dr. Sung-Won Choi / Prof. Dr. Sung-Won Choi  |                       |                            |            |                                  |         |                                |                         |                       |                            |            |                                  |         |     |   |   |   |     |  |  |

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