

**Wintersemester 2024/25**

| <b>Course</b>                 | <b>Functional Safety (2V, 1Ü)</b>   |
|-------------------------------|---|
| <b>Target group</b>           | Master Program:<br>Mechanical Engineering<br>– some newer programs (check your Prüfungsordnung)<br>Automation and Safety - Safe Systems<br>Maschinen- und Anlagenbau  |
| <b>URL of the course</b>      | <a href="https://moodle.uni-due.de/course/view.php?id=23821">https://moodle.uni-due.de/course/view.php?id=23821</a>   |
| <b>Lecturer</b>               | Univ.-Prof. Dr.-Ing. Dirk Söffker   |
| <b>Assistant</b>              | Olena Shyshova, M.Sc.   |
| <b>About course</b>           | <p>In WiSe 24/25, the course will be realized in presence at the university.</p> <p>The realization is carried out via:<br/>- Lecture and exercise material (pdf)<br/>&lt; downloadable via Moodle</p> <p>The basis of the course are the specified literature resources, available from the library or the WWW. The central teaching material is available as encrypted PDF documents in the Moodle course.</p> <p>For each lecture unit a raw manuscript is published which can be downloaded in the Moodle course <b>from the beginning of the course, possible week-wise</b>. This serves to structure/individualize the personal notes.</p> <p>For preparation/postprocessing of the lecture it is strongly recommended</p> <ul style="list-style-type: none"> <li>➤ <b>the previous substance,</b></li> <li>➤ <b>attending the consultation hours</b></li> <li>➤ <b>as well as reading the upcoming substance in the given chapters in advance (in the specified textbook/textbook) to work out.</b></li> </ul> |
| <b>Material</b>               | Moodle: Functional Safety - FS<br>( <a href="https://moodle.uni-due.de/course/view.php?id=23821">https://moodle.uni-due.de/course/view.php?id=23821</a> )   |
| <b>Registration in Moodle</b> | The password can be requested via the e-mail address <a href="mailto:srs-pw@uni-due.de">srs-pw@uni-due.de</a> .<br>The subject must contain only the word <b>FS</b> .   |
| <b>Day</b>                    | Tuesday   |
| <b>Time</b>                   | 3:45 – 7:45 pm  |

|                         |  |
|-------------------------|--|
| <b>First course</b>     | October 8th  |
| <b>Last course</b>      | November 19th  |
| <b>Room</b>             | MB 243   |
| <b>Consulting hours</b> | By appointment: contact Prof. Söffker during lecture   |
| <b>Literature</b>       | <p>Norm IEC 61508<br/> Bertsche, B. et al.: Zuverlässigkeit mechatronischer Systeme, Springer 2009<br/> Verma, A.K. et al.: Reliability and Safety Engineering, Springer, 2009<br/> Halang, W.A. (Hrsg): Funktionale Sicherheit, Springer, 2013<br/> Nanda, M. et al. (Eds.): Formal Methods for Safety and Security - Case Studies for Aerospace Applications, Springer, 2018<br/> Braband, J.: Funktionale Sicherheit. In: Fendrich, L.; Fengler, W. (Hrsg.) Handbuch Eisenbahninfrastruktur, Springer, 2019<br/> Gilbert, G. et al. (Eds): Safety Cultures, Safety Models - Taking Stock and Moving Forward, Springer, 2019<br/> Keller, H.B. et al. (Eds.): Technical Safety - An Attribute of Quality - An Interdisciplinary Approach and Guideline, Springer, 2018</p>   |
| <b>Content</b>          | <ul style="list-style-type: none"> <li>• Legal relationships and standards across different industrial sectors starting with Machinery Directive 2006/42/EG and the Product Safety Act.</li> <li>• Associated Terms and Methods: Terms (error, failure, malfunction), Systematic and Random Errors, Risk Assessment, Error Models, Failure Rates, Common-Mode Error, Requirements for Error Detection and Diagnostic Methods, Description of Requirements SIL, ASIL, PFD, PFH or POD, DR, FAR in the context of diagnostic methods</li> <li>• Methods for failure and risk minimization as well as securing functionality</li> <li>• Functional safety according to IEC 61508, EN 62061, and EN ISO 13849</li> <li>• Development and verification methodology for the automation context according to IEC 61508</li> </ul> |
| <b>Hints</b>            | Further hints regarding lecture, exam, etc. are given in the first lecture.  |
| <b>Exam</b>             | <p>Written exam, closed book, in the examination period.</p> <p><b>Bitte beachten Sie die ab SoSe24 geänderten Hinweise zu den zugelassenen Hilfsmitteln bei der Klausur.</b></p> <p><b>Please note the changes to the permitted aids for the exam from SoSe24.</b></p>  |