

## Module Information

2022.01, Approved

### Summary Information

|                     |   |
|---------------------|---|
| Module Code         | 7582RTC                                     |
| Formal Module Title | Functional Safety of Safety-Related Systems |
| Owning School       | Engineering                                 |
| Career              | Postgraduate Taught                         |
| Credits             | 10  |
| Academic level      | FHEQ Level 7                                |
| Grading Schema      | 50  |

### Teaching Responsibility

|                                   |
|-----------------------------------|
| LJMU Schools involved in Delivery |
| Engineering                       |

### Learning Methods

| Learning Method Type | Hours |
|----------------------|-------|
| Lecture              | 8     |
| Online               | 1     |
| Tutorial             | 8     |

### Module Offering(s)

| Display Name | Location | Start Month | Duration Number Duration Unit |
|--------------|----------|-------------|-------------------------------|
| SEP-PAR      | PAR      | September   | 12 Weeks                      |

### Aims and Outcomes

|      |   |
|------|---|
| Aims | To understand the role of functional safety in reducing risks, and to devise and apply Safety Integrity Level (SIL) targets and the methods appropriate to assessing the degree of risk reduction achieved, when implementing protection systems. |
|------|---|

**After completing the module the student should be able to:**

**Learning Outcomes**

| Code | Number | Description  |
|------|--------|--|
| MLO1 | 1      | Define safety functions and target Safety Integrity Level (SIL) requirements which will reduce the associated risks to a tolerable level.                                  |
| MLO2 | 2      | Apply the analysis methodologies to ensure that, when implemented, the safety systems achieve specified risk reduction targets.  |
| MLO3 | 3      | Logically deduce how the level of risk reduction achieved by a safety system could be improved and when risk has been reduced to As Low As Reasonably Practicable (ALARP). |

**Module Content**

|                        |   |
|------------------------|---|
| Outline Syllabus       | Outline Syllabus: • Introduction to Functional Safety – background, terminology and aims• The Safety Lifecycle (IEC 61508 view) • Hazard & Risk Analysis techniques• SIL Selection (setting targets and requirements)• Safety Requirements Specification development• SIL and the Design Process • Beyond Design Lifecycle Phases• Compliance Demonstration• Safety/Project Lifecycle Management  |
| Module Overview        |   |
| Additional Information | The module aims to enable students to understand and apply the principles of functional safety to the development and assessment of safety systems and is based around the important IEC 61508 functional safety standard. The module illustrates the primary elements of the safety lifecycle and how these are applied to the development of safety systems which serve to reduce the risks associated with hazardous equipment or processes to a tolerable level.The module also covers the assessment of safety systems to confirm that the functional requirements and risk reduction targets set for the system have been achieved. The module allows the students to develop expertise in the application of the techniques necessary to specify, implement and assess safety systems to meet the requirements of IEC 61508. Assessment is in the form of an essay combined with activities (e.g. exercises, discussions, etc.).The module is delivered via distance learning, described as follows:Lecture (using slides and slide notes): Online self-studyTutorial/Activities (Exercises and reviews): Online activities with teacher feedback, and virtual classroomsTutor-supported Online: Tutor feedback for activities, virtual classrooms and email support |

**Assessments**

| Assignment Category | Assessment Name | Weight | Exam/Test Length (hours) | Module Learning Outcome Mapping |
|---------------------|-----------------|--------|--------------------------|---------------------------------|
| Essay               | Essay           | 95     | 0                        | MLO2, MLO3                      |
| Test                | Test            | 5      | 0                        | MLO1                            |

**Module Contacts**

**Module Leader**

| Contact Name  | Applies to all offerings | Offerings |
|---------------|--------------------------|-----------|
| Ben Matellini | Yes                      | N/A       |

**Partner Module Team**

| Contact Name | Applies to all offerings | Offerings |
|--------------|--------------------------|-----------|
|--------------|--------------------------|-----------|