EE6614 - Reliability Engineering in Electronics Industry

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Reliability Engineering in Electronics Industry

- Electronic Products Field Failure
- Reliability Testing & Failure Analysis
- Design & Re-design for Reliability
- Root Cause Analysis

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Introduction to Reliability Engineering

Design for Reliability
Reliable Design and Quality considerations, Essential reliability factors during materiel development, Reliability of Mechanical Components and Systems.

Reliability considerations in product manufacturing
Manufacturing Process Planning and Control, Non-Invasive Testing and Handling, Reliability Acceptance Testing, Control of Production Variability, Quality Control in Electronics Production, Production Failure Reporting Analysis and Corrective Action system.

Failure modes and mechanisms
Types of failures modes and mechanisms in electronic packages, Reliability of Electronic Components, Summary of Device Failure Modes, Reliability in Electronic System Design
Main failure types: design, fabrication related defects and packaging/assembly related failures.

Reliability Testing
## Assessment

<table>
<thead>
<tr>
<th>Type of assessment tasks</th>
<th>Weighting (if applicable)</th>
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<tbody>
<tr>
<td>Continuous Assessment</td>
<td></td>
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<tr>
<td>Group project</td>
<td>20%</td>
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<tr>
<td>Individual Project (Case Study, Assignments &amp; Lab experiments)</td>
<td>30%</td>
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<tr>
<td>Examination</td>
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<tr>
<td>Written Exam (closed book, 2 hours)</td>
<td>50%</td>
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Individual Project examples:

➢ 3 categories of individual projects:

IP1 Bath Tub Curve of a specific electronic product

IP2 Failure mode, effects and criticality analysis (FMECA) for a specific electronic product

IP3 Applications of Weibull and Exponential distributions to selected electronic products
Group Project examples:

GP1 Design for Reliability – Automotive electronics
GP2 Reliability factors during product development – hard disc drive
GP3 Reliability of Electronic Systems - Component reliability assessment of PC motherboard
GP4 Reliability testing – Mobile phone