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# Software Engineering using Formal Methods

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Lecture Notes by Thomas Schulz  
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TECHNISCHE  
UNIVERSITÄT  
DARMSTADT

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# Contents

<b>Disclaimer</b>	<b>II</b>
<b>Course Introduction</b>	<b>III</b>
<b>1 Modeling &amp; Model Checking with PROMELA &amp; SPIN</b>	<b>1</b>
1.1 PROMELA Introduction . . . . .	1
1.2 Verifying with SPIN . . . . .	2
1.3 Modeling Concurrency . . . . .	3
1.4 Introduction to PROMELA/SPIN . . . . .	4
1.5 Modeling Distribution . . . . .	5
1.6 Propositional Logic & Temporal Logic (1) . . . . .	6
1.7 Temporal Logic (2) . . . . .	7
1.8 Channels & Linear Temporal Logic . . . . .	8
1.9 Temporal Model Checking with SPIN . . . . .	9
<b>2 Modeling &amp; Verification with JML &amp; KEY</b>	<b>10</b>
2.1 First-Order Logic (Syntax and Semantics) . . . . .	10
2.2 First-Order Logic – Calculus . . . . .	11
2.3 JML (1) . . . . .	12
2.4 JML (2) . . . . .	13
2.5 Dynamic Logic 1 . . . . .	14
2.6 Dynamic Logic Calculus . . . . .	15
2.7 Proof-Obligations . . . . .	16
2.8 Loop Invariants . . . . .	17

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# Disclaimer

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# Course Introduction

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# 1 Modeling & Model Checking with PROMELA & SPIN

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## 1.1 PROMELA Introduction

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## 1.2 Verifying with SPIN

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## 1.3 Modeling Concurrency

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## 1.4 Introduction to PROMELA/SPIN

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## 1.5 Modeling Distribution

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## 1.6 Propositional Logic & Temporal Logic (1)

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## 1.7 Temporal Logic (2)

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## 1.8 Channels & Linear Temporal Logic

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## 1.9 Temporal Model Checking with SPIN

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## 2 Modeling & Verification with JML & KEY

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### 2.1 First-Order Logic (Syntax and Semantics)

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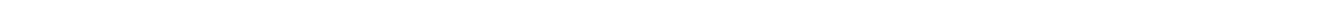
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## 2.2 First-Order Logic – Calculus

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**2.3 JML (1)**







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## 2.4 JML (2)

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## 2.5 Dynamic Logic 1

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## 2.6 Dynamic Logic Calculus

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## 2.7 Proof-Obligations

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## 2.8 Loop Invariants

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