SysML Model Builder Intermediate Exam Overview

Exam Series Code	OMG-OCSMP-MBI300
Exam Duration	105 minutes in native English-speaking countries and 135 minutes in all others. **Note**: When scheduling your exam in a non-native English-speaking country, you will not see this extra time until you complete your exam order.
Exam Fee	US$350 (or local equivalent)
Exam Type	Multiple choice (text and SysML diagrams)
Exam Pass Score	>=55 of 90 questions answered correctly (>=61%)
Exam Prerequisite(s)	Passing scores on the OCSMP Model User and Model Builder Fundamental Exams.
Exam Specifications	This exam is based on **System Modeling Language (SysML) v1.2**. Use it solely as a reference. If interested, you can only view the differences between SysML v1.2 and **v1.6**.
Recommended Exam Study Guides	***A Practical Guide to SysML: The Systems Modeling Language, 3rd Edition*** **(Friedenthal, Moore and Steiner)**: Chapters 4 (An Automobile Example Using the SysML Basic Feature Set) and 17 (Residential Security System Example Using the Object-Oriented Systems Engineering Method). All authors contributed to the SysML specification.
	Systems Engineering with SysML/UML: Modeling, Analysis, Design **(Weilkiens)**: The author contributed to the SysML specification.
Additional Reading	***MBSE Practices in Telescope Modeling*** **(Weilkiens)**
	Cookbook for MBSE with SysML: Use solely as a reference.
	Survey of Model-Based Systems Engineering (MBSE) Methodologies **(Estefan)**: Chapter 2 (Differentiating Methodologies from Processes, Methods, and Lifecycle Models)
	Systems Engineering Best Practices with the Rational Solution for Systems and Software Engineering **(Hoffmann)**
	The OMG SysML Tutorial
	Simulation-Based Design Using SysML: Part 1: A Parametrics Primer **(Peak)**: Four authors contributed to generating this exam.
	OMG SysML Website
	Hybrid SUV Example (SysML v1.2)
	SysML Notations and Conventions
Exam Training Options (not required)	**Mithun** (**Netherlands**: 4-day course)
	NobleProg (**Worldwide:** Scroll to 'Other Countries' section to change region)
Exam Voucher Program	View our **Voucher Program** for potential discounts.
Testing Accommodations	For hearing, learning, physical and/or visual disability accommodations, please contact **certification@omg.org** with proof of your most recent diagnosis thereof so we can officially request accommodation(s) on your behalf via Pearson, and once approved, provide you with further instructions on scheduling your exam(s) with your requested accommodation(s).
Exam Registration	**Pearson VUE**: create an account, locate a test center, view available tests, (re)schedule a test (online or at a test center), cancel your exam (contact Pearson VUE >24 hours prior to exam for a full refund or you forfeit the full exam price), view exam scores and **Contact Pearson VUE** (for any technical issues-**use chat feature to expedite a response**).
Online Exam Check-In & Requirements	Visit **Pearson VUE Online Proctoring** for detailed info. Log in at least 30 minutes early (online verification may take 15-20 minutes). Late arrivals will not be allowed to take the exam.
Test Center Check-In & Requirements	Arrive at least 30 minutes early. Late arrivals will not be allowed to take the exam. Bring two forms of ID (at least one with photo and both with signature): alien registration card, bank card, credit card, employee badge, government issued, green card, military, passport, school and state ID. Do not bring any items (personal or otherwise) other than the two forms of ID to a test center.

Technical Issues	Contact Pearson VUE (**use chat feature to expedite a response**).
Exam Languages	This exam is only offered in English. You cannot use a translation app during the exam.
Review Your Answers	Before completing your exam, you will be presented with a screen to review your answers to all questions.
Exam Score Reports	Whether at a test center or online, pass or fail, you will be provided with a score report on your computer screen immediately following your exam. A hardcopy of your score report will be provided before an individual leaves a test center with their score in each major section. You can also review your exam score reports via your Pearson VUE account. If you fail your exam, you can review general sections where you scored poorly to assist when you decide to retake your exam.
Digital Badges/Certificates	Those who pass their exam will immediately receive an email from Credly (admin@credly.com - check Junk folder) to claim their verifiable digital badge. Credly provides certified professionals with the option to share their certification credentials with others via the Credly Network, social media, print to .pdf or hardcopy certificate, and other avenues.
Certification Expiration	If you failed your exam, contact certification@omg.org to request a 30% discounted exam retake voucher.
Retaking the Exam	Your certification expires 5 years from the date you passed your exam. The same or a higher-level certification must be taken prior to the previous certification's expiration date to extend your certification.
Still Have Questions?	certification@omg.org

General Areas Tested in the SysML Model Builder Intermediate Exam

MODEL CONCEPTS	
Modeling guidelines and Practices Application of modeling guidelines and practices.	6%
ORGANIZING A SYSTEM MODEL USING THE FULL SET OF SYSML CONSTRUCTS	
Building A Package Diagram Using the Full Set of SysML Constructs Package and element import, defining and using view and viewpoint, building and using model libraries, as well as awareness of assessment criteria (e.g., structured queries) and activities.	6%
BUILDING A REQUIREMENTS MODEL USING THE FULL SET OF SYSML CONSTRUCTS	
Building A Requirements Diagram Using the Full Set of SysML Constructs Specialized requirements (SysML Annex C: functional, interface, performance, physical and design constraints), establishing requirements traceability (derive, verify, satisfy, refine, trace and containment), tracing requirements in tables and matrixes, representing verification and testing, test context as well as test case. **Building A Use Case Model Using the Full Set of SysML Constructs** Relating use cases to behavioral models - activity diagrams and state machines, and relating use cases to requirements.	10%
BUILDING A STRUCTURAL MODEL USING THE FULL SET OF SYSML CONSTRUCTS	
Building the Block Definition Diagram Adding Block Features: Receptions, ordered and unique collections, read only properties, property redefinition, constraint (reference to parametrics below), distributed properties. Block Relationships: Shared vs composite aggregation (white vs black diamond), association blocks and generalization sets. Value Types: Enumerations, structured value types ("position vector" with XYZ structure). Blocks and Behavior: Classifier behavior (See Friedenthal), owned behaviors, activity hierarchies on bdds. Defining instances. **Building the Internal Block Diagram** Block Properties: Creating a property specific type and notation for part multiplicities on ibd's. Ports: Flow Ports: Flow specifications and properties, conjugated ports, and compatibility rules including item flows and ports.	29%

Standard Ports: Defining required and provided interfaces, typing a port with required and provided interfaces (i.e., with a provided interface and with a classifier with use/realize relationship). Port delegation (for both flow ports and standard ports). Connectors: Nested connector ends, item flows/item properties, conveyed classifiers, typing item properties, ownership of item properties, and connector properties.	
BUILDING A PARAMETRIC MODEL USING THE FULL SET OF SYSML CONSTRUCTS	
How To Use Constraints in SysML to Model System Analyses **Defining Constraints on A Block Definition Diagram Using the Full SysML Feature Set** Nesting of constraints, trade study support (Annex E.4), measures of effectiveness, objective functions, alternatives, and constraining flows.	11%
BUILDING A BEHAVIORAL MODEL USING THE FULL SET OF SYSML CONSTRUCTS	
How To Use SysML to Model System Behavior **Building An Activity Diagram Using the Full Set of SysML Constructs** I/O Flow: Optional vs. required, streaming, rates (continuous and discrete), no buffer, overwrite, token ordering (FIFO, LIFO, etc.), data store/central buffer, object node state, parameter set, and probabilities. Control Flow: Control Operators: Flow final, and advanced control operations (decision input/ join specification). Control pins and interruptible regions. Actions: Primitive actions. Constraints: Pre/post conditions and defining properties on activities. **Building A Sequence Diagram Using the Full Set of SysML Constructs** Messages, Lifelines: Selectors, lifeline decomposition and activations (including nested). Interaction Operators: Advanced interaction operators, combining interaction operators and nesting interaction operators. Interaction Decomposition: Interaction use or references and gates. Constraints: Observations and timing constraints and state invariants. **Building A State Machine Diagram Using the Full Set of SysML Constructs** Understanding that a SM represents the states of a block (Friedenthal). Transitions: Graphical transition notation, internal transitions and deferred events. State Hierarchy: Composite states and orthogonal composite states. Pseudo States: Junction state, choice, history states - shallow, deep, fork and join, entry and exit points, and terminate nodes. Nested State Machines: Submachine states. Connection points.	33%
DEFINING STEREOTYPES, PROPERTIES, AND CONSTRAINTS (EXTENSION, SUBCLASS)	6%
Total	**100%**