

# Advanced SysML Applied™ Workshop

## – Tool-independent edition –

**This advanced SysML modeling workshop builds on principles and best practices learned in the *Essential SysML Applied™* workshop. It teaches advanced modeling techniques that will improve the precision, scalability, and clarity of your system architectures. These advanced techniques are tool-independent, and can be applied using any SysML-compliant modeling tool.**

The **Systems Modeling Language (SysML)** is a dialect of the **Unified Modeling Language (UML)** tailored for **systems engineering applications** that has been standardized by the Object Management Group as **OMG SysML™**. The SysML dialect of UML has two significant advantages over its parent language. First, it is a smaller language than UML since it has fewer diagrams and constructs, so it is easier for modelers to learn and apply. Second, SysML adds two new diagrams for defining Requirements and Parametric Constraints as first-class constructs, so it allows modelers to automate requirement verification and simulate cost/performance trade studies.

This advanced SysML workshop **explains how to apply advanced SysML modeling techniques to improve the precision, scalability, and clarity of your system architectures.** The advanced modeling topics include **recursive design, architecture patterns, cost/performance trade studies, automating Verification & Validation (V&V), model simulation and execution, system architectures, and large-scale model management.** Students who desire integrated modeling tool training may also choose versions of this workshop that are customized for popular SysML modeling tools. (For a list of workshops customized for popular visual modeling tools see the [Training](#) page of the PivotPoint web).

### WHY TRAIN WITH US? – PIVOTPOINT TRAINING ADVANTAGES

- PivotPoint workshops are **authored and taught by Model-Based Engineering experts** with 10+ years practical application experience.
- PivotPoint workshops are **intense (high Instructor/Student ratio) and pragmatic—punctuated with frequent Q&A sessions and hands-on practice exercises.**
- PivotPoint workshops are **based on proven tool-independent principles and techniques**, so you can learn a leading modeling language or architecture framework with/without a modeling tool. (For a list of workshops customized for popular visual modeling tools see the *Training* page on the PivotPoint web.)
- PivotPoint workshops are **modular and can be customized to meet your team and project needs.** To begin with, you can pick-and-choose your modeling language, and then select from modeling tool and architecture framework training options.
- PivotPoint workshops **offer flexible choices of venues (onsite, offsite, webconference) and durations (#days).**

For more details about the advantages of PivotPoint's Model-Based Engineering training check out the [“Why Train with Us?”](#) page on the PivotPoint web. But don't just take our word for it; you should also check out the [Client Testimonials](#) page on our web.

Workshop **learning objectives, prerequisites, syllabus, and logistical information** are described below.

## WHAT WILL YOU LEARN?

- Learn advanced SysML modeling techniques to refine structural and behavioral models
- Understand how to define and apply analysis/design/architecture patterns for reuse
- Learn how to model cost/performance trade studies
- Understand how models can drive simulations and generate executable code
- Learn how to customize SysML for your work domain and target platform
- Understand how to select and customize model-based processes and tools
- Learn how Architecture Description Languages such as SysML can precisely define system architectures
- Understand how to select and apply system architecture patterns and frameworks
- Learn what makes a model-based process architecture-centric
- Understand how to manage large-scale models
- Learn advanced techniques for selected SysML modeling tool (optional; see popular modeling tools supported on the *Training* page of the PivotPoint web)
- Identify the advanced SysML modeling principles and best practices most important to your team/project
- How to learn more about advanced SysML and system architecture modeling

## WHO SHOULD PARTICIPATE?

Systems engineers, system architects, software architects/engineers/developers, project managers, and others who want to learn how the SysML can improve how they architect, analyze, design, and manage complex systems will benefit from this workshop.

**PREREQUISITES:** *Essential SysML Applied™* or equivalent SysML training.

## WORKSHOP AUTHOR & CHIEF INSTRUCTOR



**Cris Kobryn** is the CEO and Founder of PivotPoint Technology Corporation, a company that specializes in Model-Based Engineering Solutions™ for tough business and engineering problems. He is an internationally recognized expert in visual modeling and Model-Based Engineering, and has successfully applied these technologies to diverse industries ranging from aerospace-defense and communications to financial services and manufacturing. Cris chaired large international teams of vendors and users to specify the Unified Modeling Language (UML) 1.x and 2.0 standards for software engineering, and the Systems Modeling Language (SysML) 1.0 standard for systems engineering. In recognition of Cris's contributions to the UML the Object Management Group (OMG) presented him with its Distinguished Service Award, and in acknowledgement of his contributions to the SysML the International

Council on Systems Engineering (INCOSE) presented him with its Outstanding Service Award.

**WORKSHOP SYLLABUS:** The workshop syllabus, in a menu form that can be customized to meet your team/project needs, is described at the end of this document. NOTE: This workshop description and syllabus are subject to revision. Check the *Training* page on the PivotPoint web for the most recent update.

**FLEXIBLE VENUES:** All of our workshops are available onsite (at a Client training facility), offsite (at a PivotPoint training facility), and via webconference.

**FOLLOW-UP CONSULTING/MENTORING SERVICES:** All of our workshops can be followed up with consulting/mentoring services that will keep your Model-Based Engineering project on track. Please check out the Consulting services page on the PivotPoint web, or contact us to discuss details.

**SCHEDULING AND COST:** Workshops must be reserved in advance by Purchase Order or prepayment. We generally require at least 4 weeks lead time for scheduling workshops, but longer lead time is desirable to reserve your preferred training dates. Workshop cost depends upon workshop duration (number of days), venue choice (onsite, offsite, webconference), and number of students.

**FURTHER INFORMATION & PRICE QUOTES:** Please visit our web site at [www.PTCorp.com](http://www.PTCorp.com), email us at [workshops@PTCorp.com](mailto:workshops@PTCorp.com), or call us at +1-760-201-0200 to discuss workshop details and receive a price quote.

# WORKSHOP MENU

All PivotPoint workshops include both structured presentations and interactive hands-on work sessions to reinforce learning principles and best practices. In addition, all workshops can be customized to address special project or team requirements.

## WORKSHOPS THAT INCLUDE STRUCTURED TRAINING + PROJECT PRACTICUM

- **3 day workshop** includes: *SysML – Advanced* and *SysML – System Architecture*, plus one of the following: *SysML – Advanced Modeling Tool* or *Advanced SysML – Project Practicum*.
- **4 day workshop** includes: *SysML – Advanced*, *SysML – System Architecture*, *SysML – Advanced Modeling Tool*, *Advanced SysML – Project Practicum*.
- **5 day workshop** includes: *SysML – Advanced*, *SysML – System Architecture*, *SysML – Advanced Modeling Tool*, and two days of *Advanced SysML – Project Practicum*.

## PROJECT PRACTICUM-ONLY WORKSHOPS — FOCUS ON PEER REVIEWS & MODEL MAKEOVERS

- **3-5 day workshop** includes: three-to-five days of *Advanced SysML – Project Practicum* where the Instructor can facilitate system architecture model peer reviews and/or model makeovers.

<p style="text-align: center;"><b>SysML – ADVANCED</b> [Module# LS103]</p> <p><b>SysML Review</b> <i>[If SysML refresher required]</i></p> <p><b>Topics</b></p> <ul style="list-style-type: none"> <li>• Recursive design</li> <li>• Advanced structural modeling techniques</li> <li>• Advanced behavioral modeling techniques</li> <li>• Analysis/design/architecture patterns</li> <li>• Advanced cost/performance trade studies</li> <li>• Model simulation and execution</li> <li>• Customizing SysML for domains and platforms</li> <li>• Model-based process selection and customization</li> <li>• Modeling tool selection and customization</li> </ul>	<p style="text-align: center;"><b>Goals</b></p> <ul style="list-style-type: none"> <li>• Learn advanced SysML modeling techniques to refine structural and behavioral models</li> <li>• Understand how to define and apply patterns for reuse</li> <li>• Learn how models can drive simulations and generate executable code</li> <li>• Understand how to customize SysML for your work domain</li> <li>• Learn how to select and customize model-based processes and tools</li> </ul>
<p style="text-align: center;"><b>SysML – SYSTEM ARCHITECTURE</b> [Module# LS104]</p> <p><b>Topics</b></p> <ul style="list-style-type: none"> <li>• System architectures and Architecture Description Languages</li> <li>• Quick Tour of OMG’s Model Driven Architecture™ standards</li> <li>• Architecture principles and best practices</li> <li>• Architecture patterns and frameworks</li> <li>• Architecture-centric processes</li> <li>• Managing large-scale models</li> </ul>	<p style="text-align: center;"><b>Goals</b></p> <ul style="list-style-type: none"> <li>• Learn how Architecture Description Languages such as SysML can precisely define system architectures</li> <li>• Understand how to define and apply system architecture patterns and frameworks</li> <li>• Learn what makes a model-based process architecture-centric</li> <li>• Understand how to manage large-scale models</li> </ul>

<p style="text-align: center;"><b>SYSML – ADVANCED MODELING TOOL: OPTIONAL</b></p> <p style="text-align: center;">[Module# LS112]</p> <p><i>[All Model-Based Engineering workshops are based on tool-independent principles and best practices. If you have already chosen a SysML modeling tool, we can integrate optional tool training into your workshop. If you have not, we can help you select one that best meets your project and team needs. For a list of workshops customized for popular visual modeling tools see the Training page of the PivotPoint web.]</i></p> <p><b>Topics</b></p> <ul style="list-style-type: none"> <li>• Team modeling</li> <li>• Document generation</li> <li>• Requirements-driven modeling</li> <li>• Pattern-based modeling</li> <li>• Modeling simulation &amp; Round-Trip Engineering</li> <li>• Customizing profiles</li> </ul>	<p style="text-align: center;"><b>Goals</b></p> <ul style="list-style-type: none"> <li>• Learn advanced techniques for selected SysML modeling tool</li> <li>• Understand the strengths and weaknesses of selected SysML modeling tool</li> </ul>
<p style="text-align: center;"><b>ADVANCED SYSML – PROJECT PRACTICUM</b></p> <p style="text-align: center;">[Workshop# LS122]</p> <p>The project practicum provides an opportunity to apply advanced SysML modeling principles and best practices to solve project modeling problems in a creative and supervised workshop environment. The practicum can be used to facilitate:</p> <ul style="list-style-type: none"> <li>• system architecture model peer reviews</li> <li>• system architecture model revisions and extreme makeovers</li> </ul> <p>Students can identify project modeling problems in advance, or Instructor will work with students to identify them.</p>	<p style="text-align: center;"><b>Goals</b></p> <ul style="list-style-type: none"> <li>• Identify the advanced SysML modeling principles and best practices that are most important to your team and your project</li> <li>• Apply advanced SysML modeling techniques to project problems that you choose</li> </ul>