AMD
together we advance_

Using the AMD Ross Agentic AI Assistant for Vivado Design Suite

ROSS-VIVADO-AI (v1.0)

Course Specification

Course Description

This course introduces the AMD Ross™ agentic AI assistant for Vivado™ Design Suite for streamlining and accelerating FPGA and adaptive SoC design workflows. The course explores the use of Ross-assisted methodologies for design creation, analysis, timing closure, and debugging within the Vivado Design Suite environment.

Participants will also learn how to leverage MCP-based knowledge grounding and guided prompts to obtain reliable and reproducible results and will also explore how Ross-assisted workflows enable efficient RTL-to-bitstream development and hardware validation.

The emphasis of this course is on:

- Explaining the role and benefits of using the Ross agentic AI assistant in programmable device design workflows
- Describing MCP architecture and knowledge grounding for trusted AI agent interactions
- Demonstrating Ross-assisted project creation, block design, and IP integration
- Applying Ross-driven design analysis techniques, including linting and log analysis
- Performing multi-run comparisons and identifying optimization opportunities
- Implementing timing closure strategies using iterative Ross-guided workflows
- Debugging simulation, AXI protocol, and hardware issues using Ross-assisted methodologies

License requirement: To complete the hands-on labs in the CloudShare environment, participants must use their own **GitHub Copilot Pro+** license. Refer to the *Lab Setup Guide* for additional setup and licensing details.

Level – FPGA 1

Course Details

- 1 day ILT (approx. 5 hours)
- 2 lectures
- 5 labs

Course Part Number – ROSS-VIVADO-AI

Who Should Attend? – FPGA and adaptive SoC design engineers and anyone who wants to evaluate AI agent-assisted design workflows

Prerequisites

- Basic knowledge of AMD FPGAs and adaptive SoCs
- Familiarity with Vivado Design Suite
- Understanding of RTL design and simulation concepts

Software Tools

- Vivado Design Suite 2026.1
- Vivado AI Assistant Extension
- Visual Studio Code (VS Code)
- GitHub Copilot (for Ross-assisted workflows)

Hardware

- Demo board: Versal™ VCK190 Evaluation Platform and Kria™ KV260 Vision AI Starter Kit

After completing this comprehensive training, you will have the necessary skills to:

- Explain how the AMD Ross agentic AI assistant integrates into programmable device design workflows
- Set up and validate a Ross-enabled AMD Vivado development environment
- Create and implement designs using Ross-guided workflows
- Analyze design data using linting, logs, and multi-run techniques
- Apply structured timing closure methodologies using Ross agentic AI assistance
- Debug simulation and protocol issues (e.g., AXI) using Ross-guided workflows
- Perform hardware debug using Ross-assisted ILA and VIO insertion

Course Outline

- **AMD Ross Agentic AI Assistant for Vivado Design Suite Introduction**

  Introduces Ross-assisted design workflows, the MCP architecture, and trust models {Lecture}
- **Agentic AI Workflows for Advanced Adaptive SoC Design**

  Examines the Vivado MCP server, agent capabilities, and knowledge base assistance {Lecture}
- **AMD Ross Agentic AI Assistant for Vivado Design Suite Knowledge Base Exploration**

  Demonstrates use of the Ross AI assistant through the Vivado IDE setup verification and knowledge base interaction, highlighting practical workflows and citation-driven insights. {Lab}
- **Spec-Driven Design Creation Prototyping on the Kria KV260 Vision AI Starter Kit**

  Applies VS Code prompts to build, implement, and validate a complete Vivado design on the Kria KV260, including custom RTL integration and DMA-based hardware verification. {Lab}
- **AMD Ross Agentic AI Assistant for Vivado Design Suite Design Analysis**

  Employs the Ross AI assistant via VS Code to perform RTL linting, diagnose optimization issues, and compare implementation strategies in a structured timing closure workflow. {Lab}
- **AXI4 Protocol Debug and Ross-Driven Timing Closure**

  Presents a two-stage design closure workflow using the Ross AI assistant, covering AXI protocol debugging in simulation followed by iterative timing closure and validation. {Lab}
- **AXIS-ILA and AXIS-VIO Insertion Flow on the Versal VCK190 Evaluation Kit**

  Explores building and instrumenting a PL-only AXI4-stream debug pipeline on the Versal VCK190 using the Ross AI assistant, focusing on AXIS-based runtime monitoring and JTAG-driven observation. {Lab}

Register Today

Visit the AMD Adaptive Computing Customer Training Portal to view schedules and register online.

© Copyright 2026 Advanced Micro Devices, Inc. All rights reserved. AMD, the AMD Arrow logo, Kria, Ross, Versal, Vivado, and combinations thereof are trademarks of Advanced Micro Devices, Inc. Other product names used in this publication are for identification purposes only and may be trademarks of their respective owners.