CADMATIC Syllabus

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Module 1: Introduction to CADMATIC

- **Overview of CADMATIC Software**
  - Introduction to CADMATIC and its role in industrial design.
  - Key features and applications in different industries: shipbuilding, offshore, power, and process industries.
  - Understanding CADMATIC's modules: 3D Design, Structural Design, Piping Design, Electrical Design, and Data Management.
- **User Interface and Navigation**
  - Overview of CADMATIC interface and workspace.
  - Navigating through menus, toolbars, and commands.
  - Setting up CADMATIC environment and workspace preferences.

Module 2: CADMATIC 3D Plant Design

- **3D Modeling Fundamentals**
  - Introduction to 3D modeling in CADMATIC.
  - Creating 3D plant layouts and spatial planning.
  - Understanding coordinate systems and units of measurement.
- **Creating and Managing Piping Systems**
  - Piping design and modeling in 3D.
  - Placing and modifying components such as pipes, elbows, tees, valves, and fittings.
  - Routing piping systems using automatic and manual tools.
  - Integrating piping design with equipment and structural models.
- **Equipment Design and Modeling**
  - Modeling different types of equipment (e.g., tanks, vessels, heat exchangers).
  - Placing equipment within the 3D plant model.
  - Creating custom equipment and integrating with piping systems.
- **Structural Design and Modeling**
  - Creating structural components (beams, columns, platforms, supports).
  - Modeling and detailing steel structures in 3D.
  - Integrating structural design with the piping and equipment layout.

Module 3: CADMATIC Drafting and Documentation

- **Generating 2D Drawings from 3D Models**
  - Creating detailed 2D drawings from 3D models (piping, equipment, and structural).
  - Understanding view types: Isometric views, orthographic views, and sectional views.
  - Working with dimensioning and annotations in CADMATIC.
- **Drawing Templates and Standardization**
  - Using predefined templates for consistent drawing standards.
  - Customizing drawing templates to meet project specifications.
  - Creating and modifying title blocks and drawing legends.

- **Bill of Materials (BOM) and Material Take-Off**
  - Generating BOM and material take-off reports from 3D models.
  - Exporting BOM data to Excel or other formats for procurement.
  - Customizing BOM to include specific information (e.g., weight, material type).

Module 4: CADMATIC Piping Design

- **Piping Systems in Detail**
  - Creating piping systems with accurate component placement.
  - Defining and managing pipe specs and materials.
  - Working with valves, flanges, and custom fittings.
- **Piping Layout and Routing**
  - Automated and manual routing of pipes.
  - Collision detection in the piping layout.
  - Creating piping supports and integrating them with structural models.
- **Advanced Piping Features**
  - Managing complex systems like multi-phase piping, pump systems, and distribution lines.
  - Interfacing with other CAD systems or databases (e.g., using CADMATIC's Import/Export tools).

Module 5: Structural Design and Detailing

- **Steel Structure Modeling**
  - Modeling of beams, columns, bracings, and foundations.
  - Creating custom structural components.
  - Structural detailing and connection design.
- **Advanced Structural Tools**
  - Work with model-based detailing and fabrication.
  - Generating shop drawings from 3D structural models.
  - Creating structural component libraries.
- **Integration with Piping and Equipment**
  - Coordination between structural, piping, and equipment designs.
  - Resolving clashes and interferences in the design.
  - Managing changes and updates across disciplines.

Module 6: CADMATIC Electrical and Instrumentation Design

- **Electrical Design Overview**
  - Introduction to electrical design in CADMATIC.
  - Creating electrical layouts and wiring diagrams.
  - Managing electrical components like panels, wiring, and conduits.
- **Instrument and Control Systems**
  - Design and modeling of instrumentation systems.
  - Creating loop diagrams and control schematics.
  - Managing and linking instrumentation data with process systems.

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Module 7: Integration and Interoperability

- **CADMATIC Data Management**
  - Managing data and project configurations in CADMATIC.
  - Using CADMATIC's data management tools for collaboration.
  - Exporting and importing data between CADMATIC and other software.
- **Interfacing CADMATIC with Other Software**
  - Integrating CADMATIC with external software systems (e.g., AutoCAD, Revit, or other 3D design tools).
  - Using CADMATIC's IFC and DXF formats for interoperability with BIM software.
- **Working with External Databases**
  - Connecting CADMATIC with external databases for component management.
  - Synchronizing data between CADMATIC and ERP systems.

Module 8: Advanced Features in CADMATIC

- **Collision Detection and Clash Management**
  - Performing clash detection in 3D models to avoid interferences.
  - Identifying and resolving design conflicts.
  - Coordination between disciplines to ensure smooth project delivery.
- **Project Management and Coordination**
  - Managing large-scale projects with multiple teams.
  - Using CADMATIC's project management tools for task tracking and team collaboration.
- **3D Visualization and Virtual Reality**
  - Creating visual walkthroughs of the plant design.
  - Using CADMATIC's visualization tools for presentations and review meetings.
  - Introduction to virtual reality (VR) integration for immersive plant design.

Module 9: CADMATIC Reports and Analysis

- **Generating Custom Reports**
  - Creating customized reports for design review, procurement, and fabrication.
  - Using reporting tools to extract and analyze project data.
  - Automating report generation for different disciplines (structural, piping, electrical).
- **Stress and Load Analysis**
  - Introduction to stress analysis tools within CADMATIC for piping and structures.
  - Conducting basic load analysis to ensure design safety.

Module 10: Final Project and Case Studies

- **End-to-End Plant Design Project**

    - Develop a complete plant design using CADMATIC, including equipment, piping, structural design, and electrical systems.
    - Generate 2D drawings, BOMs, and reports from the 3D model.
    - Present the final project with all necessary documentation.
- **Case Studies**
    - Reviewing real-world examples of CADMATIC used in various industries (shipbuilding, oil & gas, power plants).
    - Learning from industry best practices and challenges.

Tools and Technologies Covered:

- **CADMATIC 3D Design Suite**: For plant, equipment, and structural modeling.
- **CADMATIC Data Management**: For project data and team collaboration.
- **AutoCAD**: For integration with 2D and 3D plant design.
- **IFC and DXF**: For interoperability with other design tools.
- **Revit**: For BIM integration.
- **Virtual Reality (VR)**: For immersive plant design visualization.

Learning Outcomes:

By the end of this course, students will be able to:

- Use CADMATIC for comprehensive plant design, including equipment, piping, and structural elements.
- Generate 2D drawings, BOMs, and reports from 3D models.
- Perform collision detection and integrate various disciplines within CADMATIC.
- Manage large-scale projects using CADMATIC's project management tools.
- Customize and automate reports and documentation for project delivery.