Digital Manufacturing Specialization

Enrich your knowledge in Digital Manufacturing. Master design aspects and toolpath strategies for additive manufacturing.

Instructors: Sajan Kapil **+1 more**

Enroll for free
Starts Dec 2

Included with coursera PLUS • Learn more

3 course series
Get in-depth knowledge of a subject

Intermediate level
Recommended experience

4 months to complete
at 7 hours a week

Flexible schedule
Learn at your own pace

What you'll learn

- The learner will be masters of printing any product through additive manufacturing and solving any issues in model design and toolpath planning.

Skills you'll gain

Simulation and Simulation Software | Manufacturing Processes | Automation | Mechanical Design | Engineering Drawings | 3D Modeling | Visualization (Computer Graphics) | Process Development | Computer-Aided Design | Prototyping | Manufacturing and Production | Process Engineering | Robotic Process Automation | Manufacturing Standards | Mechanical Engineering | Materials science | Computer Graphics | Industrial Design | SolidWorks (CAD) | Product Engineering | View less skills

Details to know

Shareable certificate
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Advance your subject-matter expertise

- Learn in-demand skills from university and industry experts
- Master a subject or tool with hands-on projects
- Develop a deep understanding of key concepts
- Earn a career certificate from Indian Institute of Technology Guwahati

Specialization - 3 course series

This specialization provides a comprehensive understanding of computer-aided process planning, guiding learners from a CAD model to the final product. It covers the model processing stage and explores suitable printing techniques, demonstrated through real-world components. By the end of the course, participants will be proficient in digital manufacturing, equipped with expertise in CAD and CAM software, and well-versed in 3D printing solutions. This specialization is ideal for professionals seeking a career transition into Industry 4.0, as well as those working in IoT, Product Design, Materials, Mechanics, and System Design. It is particularly relevant for industries such as automotive, aerospace, FMCG, pharmaceuticals/medical equipment production, energy, metals and mining, and oil and gas, which are key sectors for implementing digital manufacturing and smart factory concepts.

Applied Learning Project

No long projects, but conceptual quizzes enrich the ideation and problem-solving skills in the field of digital manufacturing. One can have the idea of creating a new additive manufacturing technique altering the existing processes. Pre- and post-processing knowledge about the model to the final product is comprehended through the graded quizzes.

Read less

Computer Aided Design

Course 1 • 22 hours

Course details

What you'll learn

In this course, learners will be introduced to the fundamental concepts of computer-aided design and its implementation through computer graphics. The course involves topics related to the CAD foundation, 3D Graphics pipeline and its stages, OpenGL programming to implement the stages, and hands-on experience with the SolidWorks CAD tool.

This course is best suited for post-graduate university students in computed science and mechanical engineering and Professionals who started working in the manufacturing industry, mainly in design,

After completing this course, a learner will be able to
(i) Get an overview of the CAD
(ii) Learn about the 3D computer graphics pipeline - essential to implement CAD systems
(iii) Understand the stages of the pipeline
(iv) Master programming with OpenGL, a graphics library.

Read less

Skills you'll gain

Computer Graphics | 3D Modeling | Computer-Aided Design | SolidWorks (CAD) | Engineering Drawings | Visualization (Computer Graphics) | Animations

Prototyping | Mechanical Design

Elements of Computer Aided Manufacturing

Course 2 • 24 hours

Course details

What you'll learn

In this course, learners will be introduced to the fundamental concepts of computer-aided manufacturing and its implementation through open-source software. The course involves topics related to Computer-Aided Manufacturing (CAM), Computer-Aided Process Planning (CAPP), Essentials of CNC machines and Robotic Arms, NC programming, and Toolpath generation through open-source software and CAD/CAM tools PowerShape and PowerMill.

This course is best suited for undergraduate students in mechanical engineering. Professionals working across IoT, Product Design, Materials, Mechanics, and System Design functions in Automotive, Aerospace, FMCG, Pharma/Medical Equipment Production, Energy, Metals and Mining, and Oil and Gas – potential sectors for the deployment of Digital Manufacturing and Smart Factory concept.

Read more

Skills you'll gain

Manufacturing Processes | Robotic Process Automation | Computer-Aided Design | Mechanical Design | Simulation and Simulation Software | Process Development | Manufacturing and Production | Automation

After completing this course, a learner will be able to

- Write NC programs using G-codes and M-codes
- Generate NC programs for the toolpath for machining, engraving, laser cutting, etc.
- Generate NC programs for the toolpath for 3D printing

Essentials of Additive Manufacturing

Course 3 • 29 hours

Course details

What you'll learn

Additive Manufacturing, popularly known as 3D Printing, is one of the digital manufacturing processes and a key enabler of Industry 4.0. This course will introduce the fundamental concepts of different Additive Manufacturing processes. It involves a detailed discussion on the working principles, classifications, process parameters, system architecture, etc.

This course is best suited for high school, undergraduate, and post-graduate students in mechanical engineering, design department, polymer engineering, medical science, and computer science. Also helps working professionals as well as entrepreneurs interested in additive manufacturing.

After completing this course, a learner will be able to

- Get an overview of different AM processes
- Understand the physics of AM processes
- Select an appropriate Additive Manufacturing system
- Design the products for Additive Manufacturing

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Skills you'll gain

Manufacturing Processes | Prototyping | Materials science | Computer-Aided Design | Process Engineering | Manufacturing Standards | 3D Modeling | Industrial Design | Product Engineering | Mechanical Engineering

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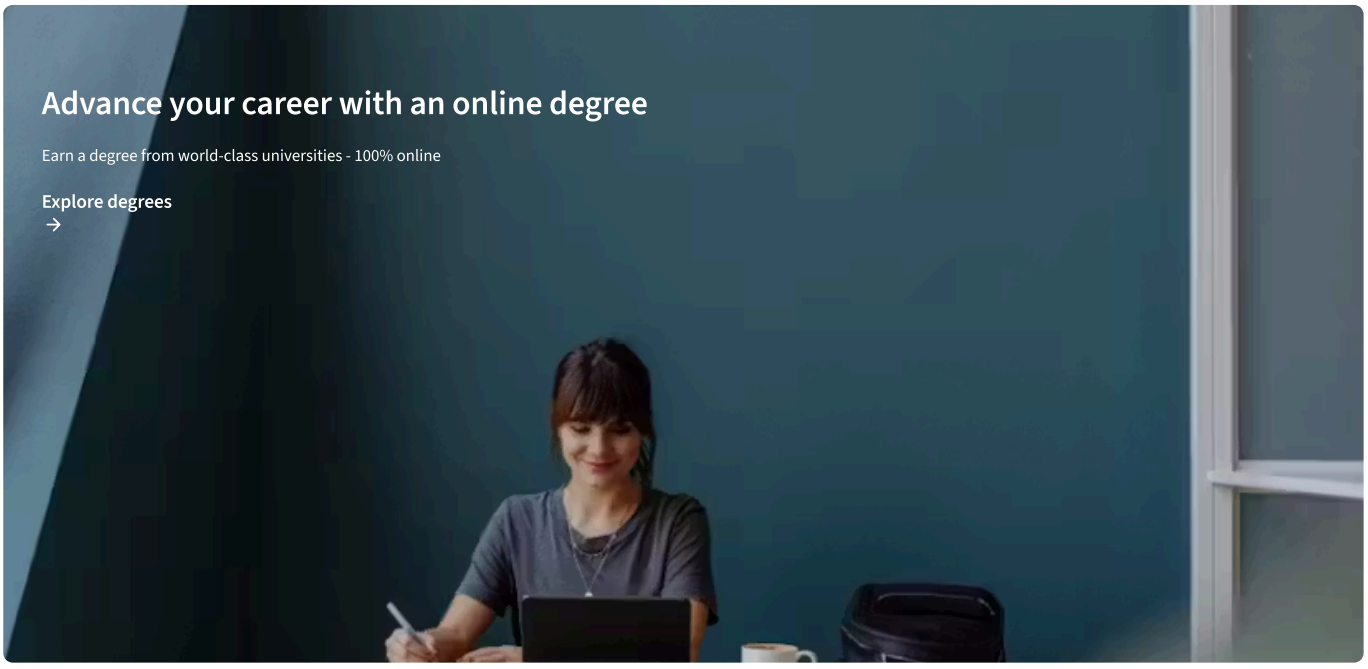

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Frequently asked questions

How long does it take to complete the Specialization?

4 months.

What background knowledge is necessary?

B.E./M.E./B.Tech/M.Tech or an equivalent degree.

Do I need to take the courses in a specific order?

No.

Will I earn university credit for completing the Specialization?

Show all 9 frequently asked questions

What will I be able to do upon completing the Specialization?

More questions

Is this course really 100% online? Do I need to attend any classes in person?

Can I just enroll in a single course?

Is financial aid available?

Can I take the course for free?

Enroll for free
Starts Dec 2

Skills
- Artificial Intelligence (AI)
- Cybersecurity
- Data Analytics
- Digital Marketing
- English Speaking
- Generative AI (GenAI)
- Microsoft Excel
- Microsoft Power BI
- Project Management
- Python

Certificates & Programs
- Google Cybersecurity Certificate
- Google Data Analytics Certificate
- Google IT Support Certificate
- Google Project Management Certificate
- Google UX Design Certificate
- IBM Data Analyst Certificate
- IBM Data Science Certificate
- Machine Learning Certificate
- Microsoft Power BI Data Analyst Certificate
- UI / UX Design Certificate

Industries & Careers
- Business
- Computer Science
- Data Science
- Education & Teaching
- Engineering
- Finance
- Healthcare
- Human Resources (HR)
- Information Technology (IT)
- Marketing

Career Resources
- Career Aptitude Test
- Examples of Strengths and Weaknesses for Job Interviews
- High-Income Skills to Learn
- How Does Cryptocurrency Work?
- How to Highlight Duplicates in Google Sheets
- How to Learn Artificial Intelligence
- Popular Cybersecurity Certifications
- Preparing for the PMP Certification
- Signs You Will Get the Job After an Interview
- What Is Artificial Intelligence?

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