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Digital Manufacturing Specialization

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

Instructors: Sajan Kapil +1 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 printin
manufacturing and solving any issue

Skills you'll gain

Manufacturing Processes | Simulation and | Automation | Computer-Aided Design
Process Engineering | Automation | Pro | ign | 3D Modeling | Computer Graphics
Materials science | SolidWorks (CAD) | M | dustrial Design | View less skills

Details to know

Shareable certificate
Add to your LinkedIn profile

Taught in English

Recommended experience

Intermediate level

B.E./M.E./B.Tech/M.Tech or an equivalent degree in any specialization

OK

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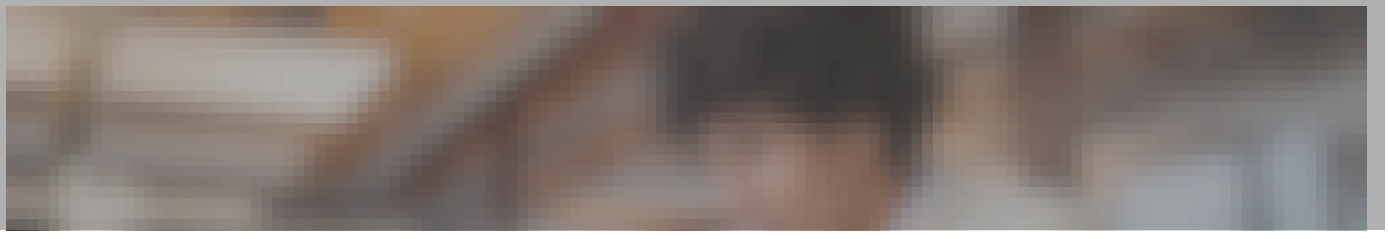
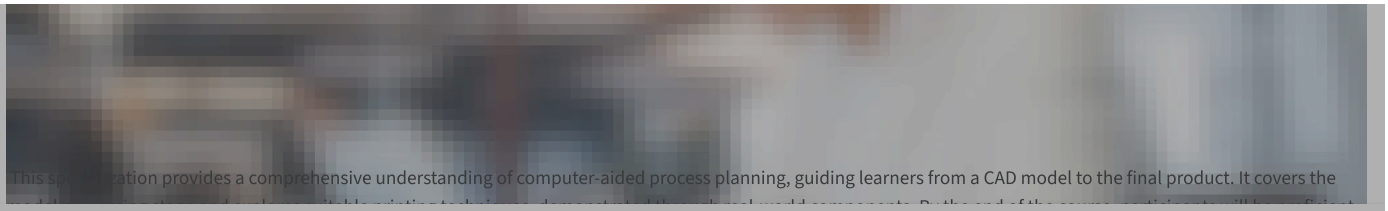




This specialization provides a comprehensive understanding of computer-aided process planning, guiding learners from a CAD model to the final product. It covers the

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

This course is best suited for post-gra ssionals who started working in the manufacturing industry, mainly in de

After completing this course, a learne
(i) Get an overview of the CAD
(ii) Learn about the 3D computer gra
(iii) Understand the stages of the pipe
(iv) Master programming with OpenG

Read less

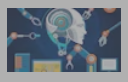
Skills you'll gain

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

Recommended experience

Intermediate level

B.E./M.E./B.Tech/M.Tech or an equivalent degree in any specialization



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.

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
- Utilize a CAD/CAM tool PowerShape and PowerMill

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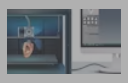
Skills you'll gain

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

Process Development | Manufacturing and Production



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

Read less

Skills you'll gain

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

Earn a career certificate

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Recommended experience

Intermediate level

B.E./M.E./B.Tech/M.Tech or an equivalent degree in any specialization

Instructors

Sajan Kapil

Indian Institute of Technology G

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Recommended experience

Intermediate level

B.E./M.E./B.Tech/M.Tech or an equivalent degree in any specialization

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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?

You will get a course completion certificate.

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

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

●Get an overview of the CAD.

●Learn about the 3D computer graphics pipeline—essential to implementing CAD systems

●Understand the stages of the pipeline, I

●Write NC programs using G-codes and M

●Generate NC programs for thetoolpath f

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●Utilize a CAD/CAM tool PowerShape and

Recommended experience

Intermediate level

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

This course is completely online, so there's no need to show up to a classroom in person. You can access your lectures, readings and assignments anytime and anywhere via the web or your mobile device.

Can I just enroll in a single course?

Yes! To get started, click the course card that interests you and enroll. You can enroll and complete the course to earn a shareable certificate. When you subscribe to a course that is part of a Specialization, you're automatically subscribed to the full Specialization. Visit your learner dashboard to track your progress.

Is financial aid available?

Yes. In select learning programs, you can apply for financial aid or a scholarship if you can't afford the enrollment fee. If fin aid or scholarship is available for your learning program selection, you'll find a link to apply on the description page.

Can I take the course for free?

No, you cannot take this course for free. When you enroll in the course, you get access to all of the courses in the Specialization, and you earn a certificate when you complete the work. If you cannot afford the fee, you can apply for financial aid.

Show less

More questions

Visit the learner help center

Financial aid available, learn more

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

Recommended experience

Intermediate level

B.E./M.E./B.Tech/M.Tech or an equivalent degree in any specialization

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

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Preparing for the PMP Certification

Signs You Will Get the Job After an Interview

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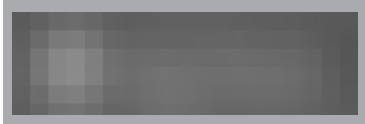

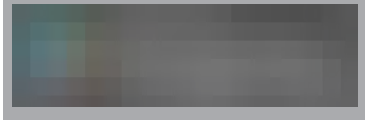

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