

# UTKARSH AGARWAL

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## EDUCATION

### NANYANG TECHNOLOGICAL UNIVERSITY

Aug 2021 – May 2025

*Bachelor of Engineering in Materials Engineering* GPA: 3.55/5

#### Relevant Courses:

Analysis of Materials (FTIR, SEM, XRD), Nanomaterials, Failure analysis, Intro to Polymer Science, Phase Transformation, Quality Control, Introduction to Manufacturing Process, Materials structure and defects, Electronic and Magnetic Properties of Materials, Electrochemical Corrosion.

## SKILLS

**Technical:** Critical Thinking, Experimental Design, Materials Selection, Prototyping, Laboratory Techniques, Troubleshooting.

**Soft Skills:** Research Focus, Design Thinking, Problem Solving, Adaptability, Creativity

**Digital:** Python, Autodesk Fusion 360, SolidWorks, MS Office, Canva

## EXPERIENCE

### EVONIK INDUSTRIES

Jul 2023 – Dec 2023

#### **Process Technology and Engineering Intern**

- Developed a profound understanding of polyurethane foams, deepening understanding of polymer chemistry.
- Conducted research and experiments to comprehend the role and significance of each chemical component in polyurethane foam formulation.
- Applied acquired knowledge to formulate and produce over 300 polyurethane foams, demonstrating hands-on expertise and contributing to various projects within the company.
- Exhibited strong laboratory skills, including precise handling of chemicals and equipment, ensuring accurate and reliable experimental outcomes.
- Accomplished laboratory inventory efficiently, ensuring the availability of necessary materials and chemicals for experiments and projects.

### JAI SHREE PAINTS & CHEMICALS

May 2023 – Jun 2023

#### **Research and Development Intern**

- Conducted over 50 comprehensive experiments focused on epoxy resin, demonstrating a meticulous and methodical approach to research
- Successfully developed innovative techniques resulting in an 80% reduction in bubbles within epoxy resin bulk, showcasing problem-solving skills and technical proficiency.
- Acquired proficiency in resin casting, a new skill, and swiftly adapted to the process, showcasing a rapid learning curve and adaptability.
- Utilized resin casting techniques to create a diverse range of products, including epoxy coasters, tables, wall art, trays, and more, highlighting creativity and hands-on craftsmanship.

### THINK DESIGN MAKE

Jun 2022 – Aug 2022

#### **Project Design Engineer Intern**

- Researched and identified affordable materials, such as Ikea table components and acrylic sheets, to create a cost-effective 3D printer enclosure, addressing the challenge of expensive commercial alternatives.
- Utilized Fusion 360 to design intricate hinges and holders, demonstrating proficiency in computer-aided design software and attention to detail in creating precise and functional components.
- Tailored the design by measuring and adapting the dimensions of Ikea table legs, ensuring a seamless fit for the enclosure components, showcasing adaptability and precision in engineering solutions.
- Employed 3D printing technology to fabricate the designed hinges and holders, demonstrating practical knowledge of additive manufacturing processes and precision in creating functional prototypes.

### JAI SHREE PAINTS & CHEMICALS

Jun 2020 – Aug 2021

#### **Lab Intern**

- Expanded understanding of surface coating's significance and its diverse applications across materials.
- Led laboratory initiatives, conducting extensive experiments exceeding 100 trials, meticulously analysing outcomes, and employing data-driven insights to refine lacquer paint formulations and enhance product efficacy.
- Demonstrated creativity by devising custom colour blends and applying them to varied objects, including statues and phone covers, contributing to aesthetic enhancements and showcasing a keen eye for visually appealing designs.

## PROJECTS

### FIRE RETARDED TRANSPARENT COATING FORMULATION

Aug 2024 – May 2025

#### (Final Year Project)

- Pursue modifying wood surfaces to achieve enhanced fire retardancy, water resistance, and transparency.
- Explored different methods, such as coatings and wood impregnation, to effectively integrate fire retardants.
- Conducted a literature review on the mechanisms of intumescent coatings and various fire-retardant chemicals.
- Reviewing research on wood impregnation techniques to infuse wood effectively with fire-retardant chemicals.
- Prepared over 80 wood samples. Successfully infused the formulation and reduced the peak heat release rate by 48%, with the initial being 208 kW/m<sup>2</sup>
- Analysed the samples using FTIR, TGA, Optical Microscopy, and Cone Calorimeter.

### INDUSTRIAL DESIGN PROJECT – OMYA x NTU

Jan 2024 – Apr 2024

- Collaborated with OMYA to develop paper-based packaging for drinking water, focusing on material composition and environmental sustainability.
- Conducted an in-depth analysis to identify and replace components that hindered the recycling process, utilising advanced material selection techniques.
- Engineered a composite material combining LDPE and calcium carbonate (CaCO<sub>3</sub>), achieving a nanoparticle size for CaCO<sub>3</sub> to enhance material performance.
- Developed a thin layer with improved optical properties, achieving superior light absorbance and comparable transmittance to aluminium.

## CO-CURRICULAR ACTIVITIES

### Da Vinci 3D Printing & Robomaster Society - Vice President

Oct 2023 – Aug 2024

- Developed innovative initiatives and strategic plans for the academic year.
- Orchestrated a hackathon at NTU, aligning with sustainability goals by addressing the "best out of waste" concept.
- Established partnerships with NTU's Residential Education Society to secure access to 'cREate,' a dedicated space equipped with 3D printers and DIY tools, facilitated the club's activities.
- Conducted workshops aimed at enhancing student understanding and engagement in additive manufacturing techniques and applications.

### Da Vinci 3D Printing & Robomaster Society - Projects Director

Sep 2022 – Aug 2023

- Orchestrated the successful OGEM event, catering to 200 exchange students, enhancing their experience at NTU.
- Utilized 3D printing technology to create innovative and visually appealing keychain designs, serving as unique NTU merchandise for exchange students, fostering a sense of appreciation and belonging
- Demonstrated strong project management skills by coordinating logistics, resources, and timelines for the OGEM event and keychain production
- Oversaw the entire production process, ensuring the quality and timely delivery of 500 3D-printed keychains
- Facilitated a collaborative partnership between the 3D Printing Club and a prominent 3D printing company.