



Project No.  
13006

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2025

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المعهد الهندسي لخدمات التكنولوجيا والبرمجيات

Engineering office for Technology and Software Services

## Industrial & Vegetable Grease Manufacturing

**Training Course Plan:  
Industrial & Vegetable  
Grease Manufacturing**

**Duration:  
4 Weeks  
(8 Lectures)**

**Target Audience:**

- Chemical & mechanical engineers
- Industrial technicians & operators
- Entrepreneurs & business owners
- Researchers & chemists

**Week 1: Introduction to Grease Manufacturing/ 4 Weeks 6 lectures**

1. Basics of Lubrication & Grease Composition
  - Differences between grease, oils, and lubricants
2. Key components: Base oils, thickeners, and additives

**Week 3: Quality Control & Performance Testing Lecture 5**

- Grease Performance Testing
- NLGI consistency grading and penetration tests
- Oxidation stability, dropping point, and water resistance

**Week 2: Raw Materials & Production Processes Lecture-4**

3. Raw Materials Selection
  - Mineral vs. synthetic base oils
  - Thickener types: Lithium, calcium, aluminum, polyurea
4. Manufacturing Processes & Formulations.
  - Batch and continuous production methods
  - Homogenization, saponification and finishing techniques

**Course Outcomes**

- Understand grease composition, raw materials, and production techniques

**Week 4: Market Strategies & Industrial Applications Lecture 8**

- Equipment, cost estimation and production scaling
- Supply chain & raw material sourcing
- Knowledge of safety, environmental compliance and quality control
- insights into business opportunities in grease manufacturing

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### Training Course Plan: Industrial & Vegetable Grease Manufacturing Code: 13006-Greas

**Duration:** 4 Weeks (8 Lectures)

#### Technical Information

#### 1. Composition & Chemistry of Greases

- **Base Oils:** Mineral, synthetic, and vegetable-based oils.

Main Branch: United building – E Shams –Front NBE  
, El Siouf \_Alexandria

Tel: 01102060500-01144470856



الفرع الرئيسي: عمارات المتحدة – عمارة عين شمس – امام البنك  
الاهلي – السيوف- الاسكندرية

تليفون: 01102060500 - 01144470856

E-mail. [adelramadan@eotss-academy.com](mailto:adelramadan@eotss-academy.com)  
[info@eotss-academy.com](mailto:info@eotss-academy.com)





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- **Thickeners:** Lithium, calcium, aluminum complex, and polyurea.
- **Additives:** Anti-wear agents, extreme pressure (EP) additives, and corrosion inhibitors.

## 2. Manufacturing Process

- **Raw Material Selection:** Choosing suitable base oils, thickeners, and additives.
- **Grease Formulation:** Proper blending and homogenization of ingredients.
- **Saponification Reaction:** Chemical reaction used in thickener production.
- **Mixing & Heating:** Controlled temperature processing to achieve desired consistency.
- **Cooling & Packaging:** Final processing and quality checks before packaging.

## 3. Performance & Quality Testing

- **Penetration Test (ASTM D217):** Measures grease consistency.
- **Dropping Point Test (ASTM D2265):** Determines heat resistance.
- **Shear Stability:** Assesses mechanical durability.
- **Oxidation Resistance:** Evaluates long-term performance.
- **Water Washout Test:** Tests grease resistance to moisture.

## 4. Industrial Applications

- **Automotive Lubrication:** Bearings, chassis, and CV joints.
- **Machinery & Heavy Equipment:** High-load and high-temperature applications.
- **Food-Grade Greases:** Safe for use in food processing industries.
- **Eco-Friendly Greases:** Biodegradable and sustainable lubrication solutions.

## 5. Environmental & Safety Considerations

- **Biodegradable Grease Technologies:** Reducing environmental impact.
- **Compliance with Regulations:** REACH, EPA, and ISO standards.
- **Safe Handling & Storage:** Preventing contamination and degradation.

## Industrial & Vegetable Grease Manufacturing Training

This course provides an in-depth understanding of **industrial and vegetable-based grease manufacturing**, covering everything from raw material selection to advanced formulation techniques. Participants will explore the **chemistry, production processes, performance testing, and applications** of greases used in automotive, industrial, and eco-friendly sectors. By the end of the training, attendees will be equipped with **technical expertise** to produce high-quality lubricants that meet industry standards and sustainability requirements. Whether you're an engineer, entrepreneur, or technician, this course will help you develop **practical skills** for formulating, testing, and optimizing grease products.

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الاهلي – السيوف- الاسكندرية

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### Target Audience:

- **Chemical & Mechanical Engineers** – Involved in lubrication technology.
- **Industrial Technicians & Operators** – Working in grease and lubricant production.
- **Entrepreneurs & Business Owners** – Interested in starting a grease manufacturing business.
- **Researchers & Chemists** – Studying lubrication, additives, and sustainable alternatives.



### Detailed Course Content



#### Week 1: Introduction to Grease Manufacturing



##### Lecture 1: Basics of Lubrication & Grease Composition

- Differences between grease, oils, and lubricants.
- Key components: Base oils, thickeners, and additives.



##### Lecture 2: Types & Applications of Grease

- Industrial, automotive, and marine greases.
- High-temperature and extreme-pressure (EP) greases.



#### Week 2: Raw Materials & Production Processes



##### Lecture 3: Raw Materials Selection

- Mineral vs. synthetic base oils.
- Thickener types: Lithium, calcium, aluminum, polyurea.



##### Lecture 4: Manufacturing Processes & Formulations

- Batch and continuous production methods.
- Homogenization, saponification, and finishing techniques.



#### Week 3: Quality Control & Performance Testing



##### Lecture 5: Grease Performance Testing

- NLGI consistency grading and penetration tests.
- Oxidation stability, dropping point, and water resistance.



##### Lecture 6: Environmental & Safety Standards

- Biodegradable greases and eco-friendly alternatives.
- Compliance with ASTM, ISO, and industry regulations.

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#### ◆ Week 4: Market Strategies & Industrial Applications

##### 📖 Lecture 7: Grease Manufacturing Business Setup

- Equipment, cost estimation, and production scaling.
- Supply chain and raw material sourcing.

##### 📖 Lecture 8: Market Trends & Innovations in Lubrication

- Synthetic and bio-based greases.
- Future advancements in nano-lubricants and smart greases.

#### 📌 Course Outcomes

- ✓ Understanding grease composition, raw materials, and production techniques.
- ✓ Ability to test and improve grease formulations for industrial applications.
- ✓ Knowledge of safety, environmental compliance, and quality control.
- ✓ Insights into business opportunities in grease manufacturing

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