



# STARK STATE COLLEGE

## GENERAL SYLLABUS

### Course Information

**Course Name:** Compressor Coating Processes  
**Course Number:** ARL143

### Required Materials

**Textbook(s):** None  
**Required Readings:** None  
**Additional Materials:** Scientific Calculator, Laptops, Note Pads, Writing Utensils, Web Links, Handouts and related items as provided in class.

### Course Outline/Calendar

The date of coverage and order of coverage may be modified based on the faculty member and events beyond the control of faculty members that interfere with class times and teaching.

Week	Chapter/Topic/Lab
1 – Introduction to Industrial Coatings and Compressors	<ul style="list-style-type: none"> <li>○ Topics: History and purpose of protective coatings. Compressor components, materials, and operation. The role of coatings in preventing corrosion and wear. Health, safety, and environmental (HSE) protocols for industrial coating applications.</li> </ul>
2 – Surface Preparation: Principles and Techniques	<ul style="list-style-type: none"> <li>○ Topics: Corrosion fundamentals. Substrate identification (e.g., steel, aluminum). Surface cleaning methods: solvent, detergent, and high-pressure washing. Abrasive blasting theory and equipment.</li> </ul>
3 – Advanced Surface Preparation and Inspection	<ul style="list-style-type: none"> <li>○ Topics: Surface profile standards (e.g., SSPC/NACE). Abrasive media selection. Inspection of prepared surfaces. Tooling and equipment for measuring surface profile and cleanliness.</li> </ul>
4 – Practical Surface Preparation Workshop	<ul style="list-style-type: none"> <li>○ Workshop: Hands-on abrasive blasting and surface cleaning on a variety of compressor components. Practice inspection techniques and tool usage.</li> </ul>
5 – Coating Chemistry and Types	<ul style="list-style-type: none"> <li>○ Topics: Classification of coatings: acrylics, urethanes, epoxies. Curing mechanisms of different coating systems. Primer, intermediate, and topcoat properties.</li> </ul>
6 – Specialized Compressor Coatings	<ul style="list-style-type: none"> <li>○ Topics: Aluminum-ceramic coatings. Anti-fouling coatings. Erosion-resistant coatings. Thermal barrier coatings for high-temperature applications.</li> </ul>
7 – Coating Selection and Specification	<ul style="list-style-type: none"> <li>○ Topics: Factors affecting coating selection (operating environment, temperature, fluid composition). Reading and interpreting coating specifications. Vendor-specific product data sheets.</li> </ul>
8 – Coating Materials Lab	<ul style="list-style-type: none"> <li>○ Workshop: Prepare and mix different coating systems (e.g., two-component coatings) according to manufacturer instructions. Conduct lab tests on cured panels to compare properties like hardness and flexibility.</li> </ul>

<b>Week</b>	<b>Chapter/Topic/Lab</b>
9 – Spray Applications Theory	<ul style="list-style-type: none"> <li>○ Topics: Different spray methods: conventional, airless, and HVLP. Equipment selection and setup. Troubleshooting common spray equipment issues.</li> </ul>
10 – Advanced Application Techniques	<ul style="list-style-type: none"> <li>○ Topics: Manual vs. automated coating application. Achieving proper wet film thickness (WFT). Multi-coat application techniques. Specialty applications like zinc-rich primers.</li> </ul>
11 – Coating Application Workshop (Part 1)	<ul style="list-style-type: none"> <li>○ Workshop: Hands-on practice using various spray guns and techniques. Focus on achieving an even, consistent coating on prepared test panels.</li> </ul>
12 – Coating Application Workshop (Part 2)	<ul style="list-style-type: none"> <li>○ Workshop: Apply a complete, multi-coat system to an actual compressor component following a specific project plan. Practice proper handling, masking, and setup.</li> </ul>
13 – Coating Inspection and Quality Control	<ul style="list-style-type: none"> <li>○ Topics: Inspector responsibilities. Inspection tools and methods for dry film thickness (DFT), adhesion, and pinhole detection. Adherence to quality management systems.</li> </ul>
14 – Coating Defects and Failure Analysis	<ul style="list-style-type: none"> <li>○ Topics: Identification of common coating defects (e.g., orange peel, fisheyes, cracking). Root cause analysis of coating failures. Prevention and corrective actions.</li> </ul>
5 – Repair and Maintenance of Coatings	<ul style="list-style-type: none"> <li>○ Topics: Damage inspection and assessment. Repair procedures for localized coating damage. Maintaining coating integrity over a compressor's lifecycle.</li> </ul>
16 – Final Review and Certification	<ul style="list-style-type: none"> <li>○ Topics: Comprehensive review of all course material. Written and practical exams to assess knowledge and skills</li> </ul>