COURSE FAB3120: FOUNDRY 3 (CORE MOLDING)

Level: Advanced

Theme: Production Systems and Processes

Prerequisite: FAB1120 Foundry 1 (One-piece Pattern)

Description: Students investigate and apply advanced foundry processes to produce a hollow casting, using a sand and core mold.

Parameters: Access to a fabrication facility complete with foundry equipment and supplies and to instruction from an individual with specialized training in foundry practices.

Supporting Course: FAB2120 Foundry 2 (Split Pattern)

Curriculum and Assessment Standards

General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• list and describe common core materials and production processes	• written or oral report that: – describes how cores are designed and fabricated – lists four different core binders and setting techniques – explains how cores are placed and reinforced in a mold. *Assessment Tool* *Assessment Framework: Presentations/Reports, CTSPRE* *Standard* *Performance rating of 3 for each applicable task*	10
• demonstrate advanced sand casting and coring skills and techniques	• completion of a hollow casting using an appropriate coring technique. *Assessment Tool* *Assessment Framework: Product Assessment, FABPRD* *Standard* *The core should break down at the end of the casting process and be easily removed. The casting should be clean and free of voids and meet size, shape and finish expectations.* *Performance rating of 3 for each applicable task*	70

COURSE FAB3120: FOUNDRY 3 (CORE MOLDING) (continued)

General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
The student will: • create a profile of a trade or occupation within the foundry field	*Assessment of student achievement should be based on:* • presentation of an occupational profile that outlines: – description of the trade/occupation and conditions of work – employment opportunities – training requirements and opportunities. *Assessment Tool* *Assessment Framework: Research Process, CTSRES* *Standard* *Performance rating of 3 for each applicable task*	20
• demonstrate basic competencies.	• observations of individual effort and interpersonal interaction during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	

Concept	Specific Outcomes	Notes
Orientation	*The student should:*	
• Cores	• explain the purpose of a core and provide examples of products that require their use in casting	An engine block is a good example of a part that requires cores.
	• describe the variables and characteristics of good core mix	
• Binders	• identify common binders that can be used with core sand; e.g.: sodium silicate and CO_2, linseed oil, wheat flour and molasses and other commercially prepared products	
• Core Construction	• identify common shapes and methods of producing and drying a core	
• Core Placement	• research and describe common methods of supporting core in mold cavity.	

COURSE FAB3120: FOUNDRY 3 (CORE MOLDING) (continued)

Concept	Specific Outcomes	Notes
Planning and Management	*The student should:*	
• Core Design	• for a given casting, identify the appropriate core shape placement technique, core mix and reinforcement techniques • prepare a sketch showing the location of: – parting line and type of mold – core and core prints – venting, gating and pouring system for a given casting	
• Health and Safety	• describe safety concerns related to: – personal protective equipment – mold construction – foundry furnace start-up and shut-down procedures – heating and pouring procedures – cleaning and finishing castings • describe a safety plan in case of accident	
Implementation • Material Processing	• create a casting using common pattern making, coring and pouring techniques • clean and finish the casting according to specification.	Begin with a simple part such as a hollow cylinder that could later be machined into a collar or bushing.
Assessment • Quality Control	• analyze the overall size, shape and structural soundness of the product	
• Career Information	• identify ways to gain experience and further training in foundry work • research and describe career and further training opportunities related to foundry work • evaluate personal interests and abilities related to making realistic career choices	
• Career Preparation	• prepare a record of completed activities within a portfolio.	