

**Teaching and Examination Scheme:**

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE (E)	PA (M)	PA(V)	PA (I)	
00	00	15	15	00	00	100	100	200

L- Lectures; P- Practical; OJT- On Job Training; C- Credit; ESE- End Semester Examination;  
PA- Progressive Assessment

**Content:**

Sr. No.	Topic	No. of Hours
1	<p><b>Introduction to Casting Process</b></p> <p>Classification of Casting process, Sand Casting, Plaster mold casting, Permanent mold casting, Centrifugal casting, Investment casting. Introduction, type of sand use, terminology, sand casting process, machinery used, application. Introduction of plaster mold casting, terminology, process of plaster mold casting, machinery used in plaster mold casting and application. Introduction of permanent mold casting, terminology, equipment use, process, application. Centrifugal casting, steps use in centrifugal casting, application. Die making ,pattern making ,cluster making ,sprue making ,washing ,cell making ,dewaxing , drying of cell ,melting and pouring, knock out.</p>	10
2	<p><b>Pattern Making</b></p> <p>Pattern materials. Pattern making tools, different pattern materials their merits and Demerits. Different types of patterns such as single piece, Cope and Drag, Followboard, Match plate pattern etc. Principles of pattern construction and layout. Machines for making wooden pattern and machine patterns. Finishing of patterns, colour codes for pattern and importance. Pattern allowances.</p> <ul style="list-style-type: none"> <li>Understand the Factors Affecting the Design and Construction of Pattern</li> <li>Understand Equipment and the Reasons for selection of Materials Used in Patternmaking</li> </ul>	40
3	<p><b>Molding Technology</b></p> <p>Hand moulding with green sand using natural binders like clay, use of mechanical ramming aids &amp; mould manipulation dry sand process, loam sand moulding, use of cow dung, Bentonites dextrin core oils &amp; molasses as binder, mould washers Skin drying of moulds.</p> <p>Use of moulding machines, jolt squeeze, jolt squeeze &amp; slinger, insertion of cores, power computation, type of flask equipment, preparation of sand cycle, mulling of the sand, flow charting special moulding/core making process, Use of plaster of Paris &amp; cement as a moulding material carbon dioxide process, shell moulding &amp; metal moulds, gravity &amp; pressure die casting, V moulding processes.</p> <p>Function of cavity, components of mould, gating system &amp; risers, Directional</p>	60



	<p>solidification of metals, streamlined pouring of mould, maintenance of metal purity, Rigging and shake out, recycling of sand, reclamation of sand.</p> <p>Importance and requirement of cores, Core making materials. Core sand, its ingredients and properties. Binders &amp; machines used in core making. Types of Cores, Core making processes. Core venting, Core baking by different methods.</p>	
4	<p><b>Gating System and Riser system</b></p> <p>Components of gating system-Pouring basin, down sprue, sprue well, runner bar, skim bob and in gates, Significance and function. Types of gating: Top gate, bottom gate and parting gates.</p> <p>Steps in design of gating system, calculations of pouring time, Runner sand in gates for ferrous and non-ferrous alloys. Importance and determination of dimensions of passages in gating ratio.</p> <p>Function of risers/feeders in compensating shrinkage in metals and alloys during solidification .Riser types, shapes, sizes and locations.</p> <p>Designing of risers using Cain’s method, modulus method, Inscribed circle method.</p>	20
5	<p><b>Casting: Hands on Practices</b></p> <ul style="list-style-type: none"><li>•Categorize different types of tools, equipment &amp; raw material used in foundry following safety precautions.</li><li>•Produce green sand moulds by using appropriate hand tools.</li><li>•Produce different casting components by different metal with different moulding process and finish the casting as per requirement</li><li>•Produce wooden joint, make pattern and repair defective pattern and boxes</li><li>•Prepare mould with loose piece pattern and loose piece core box.</li><li>•Prepare mould by different moulding process, make cast iron castings identify defects.</li></ul>	70

**Reference**

CERTIFICATE COURSE IN FOUNDRY TECHNOLOGY (NSQF Level 5)