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المعهد العالي للصناعات البلاستيكية
Higher Institute for Plastics Fabrication

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

# Training Plan HIPF Diploma

Higher Institute for Plastics Fabrication is a premiere Institute in the field of Plastics Technology. It was started on 8th September 2007 as a non-profit institute in an agreement signed by the Ministry of Energy along with Technical and Vocational Training Corporation (TVTC), the Eastern Petrochemicals Company (SHARQ) and the Saudi Petrochemical Development Company (SPDC), Japanese partner of SHARQ.

The establishment of HIPF aims to train Saudi Youth under Japanese Expert's supervision to participate as skilled technicians in the booming plastics industry of the Kingdom.

| SEMESTER | NO | CODE | COURSE TITLE | TRG HOURS | PREREQUISITE | NO. OF UNITS | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | CT | CT | PT | Cr.H |
| 1st (21 weeks) | 1 | ENG 101 | English (Introduction) | 525 | - | 25 | 25 | 0 | 0 |
| | 2 | COM 111 | Computer | 84 | - | 4 | 2 | 2 | 3 |
| | 3 | CHM 121 | Chemistry | 84 | - | 4 | 2 | 2 | 3 |
| | 4 | WET 131 | Work Ethics | 42 | - | 2 | 2 | 0 | 2 |
| | | | | | | | | *Total* | *8* |
| 2nd (21 weeks) | 5 | ENG 202 | English (ESP I) | 231 | ENG 101 | 11 | 11 | 0 | 0 |
| | 6 | MAT 241 | Mathematics | 63 | - | 3 | 3 | 0 | 3 |
| | 7 | PLS 251 | Basic Engineering | 168 | ENG 101 | 8 | 8 | 0 | 8 |
| | 8 | PLS 252 | Basic Plastics | 126 | CHM 121 | 6 | 6 | 0 | 6 |
| | 9 | PLS 253 | Sheet Thermoforming | 147 | CHM 121 | 7 | 3 | 4 | 5 |
| | | | | | | | | *Total* | *22* |
| 3rd (21 weeks) | 10 | ENG 303 | English (ESP II) | 63 | ENG 202 | 7 | 7 | 0 | 0 |
| | 11 | PLS 354 | Plastics Test Methods | 84 | PLS 252 | 4 | 2 | 2 | 3 |
| | 12 | PLS 355 | Injection Molding | 245 | PLS 251, PLS252 | 12 | 4 | 8 | 8 |
| | 13 | PLS 356 | Blow Molding | 245 | PLS 251, PLS252 | 12 | 4 | 8 | 8 |
| | | | | | | | | *Total* | *19* |
| 4th (21 weeks) | 14 | ENG 404 | English (ESP III) | 91 | ENG 303 | 1 | 1 | 0 | 0 |
| | 15 | PLS 457 | *Blown Film Extrusion | 231 | PLS 251, PLS252 | 11 | 3 | 8 | 7 |
| | 16 | PLS 458 | *Pipe Extrusion | 231 | PLS 251, PLS252 | 11 | 3 | 8 | 7 |
| | 17 | PLS 459 | On the Job Training (OJT) | 280 | | According to work | | | 6 |
| | | | | | | | | *Total* | *20* |
| | | | | | | | | *Total Credit Points* | 69 |

*49 hrs covered in 3rd sem

**CTH: Contact Hours - CT: Class Training Hours - PT: Practical Training Hours - Cr.H: Credit Hours**

*Coding Abbrv.Name Sem -subject no.- sub subject no.*

| Course Title | Course Description |
|---|---|
| **ENGLISH**<br>**ENG 101**<br>1ST SEMESTER | Introductory level English instruction course. Foundation fundamentals such as grammar, vocabulary, conversation, listening, reading & writing are covered. Trainees are fully engaged in an English speaking environment during the lessons. All courses are taught by native English speakers. |
| **COMPUTER**<br>**COM 111**<br>1ST SEMESTER | Introduction to Computers, Windows, Microsoft Word, Excel, PowerPoint & also Internet & E-mail. This course has both Theory & Practical classes as per the needs. |
| **CHEMISTRY**<br>**CHM 121**<br>1ST SEMESTER | Basic principles of chemistry in relation to polymers, atomic structure, chemical bonding, types of polymers, important characteristics of plastics, effect of the environment, etc. are introduced. It is supported by experiments in the laboratory. |
| **WORK ETHICS**<br>**WET 141**<br>1ST SEMESTER | An Introduction to work ethics covering individual behavior, skills for getting jobs, work laws & regulation, work ethics, work habits, problem solving, self development, communication skills |
| **ENGLISH FOR SPECFIC PURPOSE I**<br>**ENG 202**<br>2ND SEMESTER | Introduction to various technical & science terms used during the work in technical field. |
| **MATHEMATICS**<br>**MAT 231**<br>2ND SEMESTER | Operations on Real Numbers, Percentage, Plotting & Reading of Graphs, Operations on Polynomials, Linear Equations in One or Two Un-known's, Exponential & Logarithmic Functions, Plane & Space Geometry, Elements of Analytical Geometry, & Methods of Comparison between Measurement Results. |
| **BASIC ENGINEERING**<br>**PLS 251**<br>2ND SEMESTER | Safety engineering, accidents -its causes & prevention, the principle of 5S & KY, general overview & safe operation procedures for operation of plastic processing machines & good shop floor practices. Basic industrial engineering, introduction to machinery, daily machine inspection guide, cost accounting method for processed goods, introduction to electrical engineering, introduction to control technology, introduction to measurement & quality control. |
| **BASIC PLASTICS**<br>**PLS 252**<br>2ND SEMESTER | Introduction to Petrochemical industry, basics of polymers & polymerization, classification of plastics, plastics materials & their properties; formulation technology, overview of the fabrication processes for plastics: Injection Molding, Blown Film Extrusion, Blow Molding, Pipe Extrusion, Sheet Extrusion, Thermoforming, Physical Properties of molten resins & recycling technologies. |
| **SHEET THERMO - FORMING**<br>**PLS 253**<br>2ND SEMESTER | Concepts, theories, safety, 5S, & good shop floor practices FOR Sheet extrusion & Thermoforming are introduced. H&s on & practical training including Standard operating procedure (SOP) & machine maintenance are also covered. |
| **ENGLISH FOR SPECFIC PURPOSE II ENG 303**<br>3RD SEMESTER | The in-house practices to improve the speaking, reading, writing & listening skills. Supplementary material to improve English proficiency is included. |

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| **PLASTICS TEST METHODS**<br>**PLS 354**<br>3RD SEMESTER | This course covers General Safety, Measurements, Plastics Testing, Specification and Test Standards and their importance and meanings which is highly used in plastics industry for quality inspection as well as in product research and development. Training covers theoretical and practical. Practical activities includes Micrometer and Vernier Caliper reading, Mechanical Testing includes Tensile, Flexural, Charpy Impact, Dart Impact, Puncture Impact and Tear Test. Optical Testing includes Haze, Gloss and Color Test. Thermal Testing includes Deflection Temperature under Load (DTUL). Material Characterization includes Melt Flow Rate Test. |
| **INJECTION MOLDING**<br>**PLS 355**<br>3RD SEMESTER | This course covers details of the Injection molding history, theory, process, cycle, parameters & machine used. The Machine operation, types, groupings, control panel, specifications, hydraulic system & parts. The common plastic materials used in Injection Molding will be reviewed. The mold structure, parts, types, groupings, its setting, maintenance & configurations is also covered. Understanding of SOP (Standard Operating Procedures) for machine operations, mold change, Parameter setting & machine maintenance. Fundamentals of common secondary processes & auxiliary equipments are provided. The common Molding Defects & possible countermeasures. This course also includes Demo run in latest technology in Injection molding like Electrical injection molding machine, multi-component injection molding process by using strategic plastic materials like PC,PMMA,NYLON & TPE . Also includes secondary fabrication techniques like PAD printing, hot-stamping, ultrasonic welding & automatic screw driving. |
| **BLOW MOLDING**<br>**PLS 356**<br>3RD SEMESTER | The course covers Blow Molding Process, Blow Molding Safety Practices, Blow Molding Machine, Process & Equipment, Blow Molding Machine parts & function, Machine Operation, Mold & Tooling Change Over & Set-Up, Changing Material & Master Batch, Mold & Machine Maintenance, Machine & Process Troubleshooting, Product Quality Testing, Auxiliary equipment & process recycling, Other related process. The course also includes Demo run of stretch blow molding process using two stage machines like HUSKY & SIDEL, testing procedure for performs & PET bottles. In theory it covers the knowledge of PET resin; PET bottles & performs trouble shooting. |
| **ENGLISH FOR SPECFIC PURPOSE III ENG 404**<br>4TH SEMESTER | Trainees will continue to build on the skills learned in the previous course. Also covered the communication. |
| **BLOWN FILM EXTRUSION**<br>**PLS 457**<br>4TH SEMESTER | BF Extrusion Definition & Principles, Products & its Applications, Comparison between BF & Flat Film Extrusion, Optimization of Blown Film Process , Materials for BF Extrusion, Types of Blown Film Machines, Major Parts of Blown Film Machine, Secondary Processes, Related Technologies, Safety Operations,(H&s-on operating skills), Production set-up, Troubleshooting, Production with Quality control, Preventive maintenance. H&s on operation on Blown film machine & process parameters setting by using LLDPE, LDPE & HDPE material. Also covers working principle of flexographic printing & bag making machine & recycling machine. |
| **PIPE EXTRUSION**<br>**PLS 458**<br>4TH SEMESTER | This course covers Pipe extrusion technology, understanding the machine parts & their functions, the machine mechanism, safety machine operation, the operating principles. It also covers the hands on operation on Pipe extrusion machine & techniques of HDPE, PP & PVC pipe processing, recycling, operation of crusher & pelletizer. Analyzing the basic characteristics of Pipes & reporting methods in a plastic pipe production set up. This course also covers plastics processing integration program with plastics testing. |
| **ON THE JOB TRAINING (OJT)**<br>**PLS 459**<br>4TH SEMESTER | The trainees go to respective companies for on the job training. |