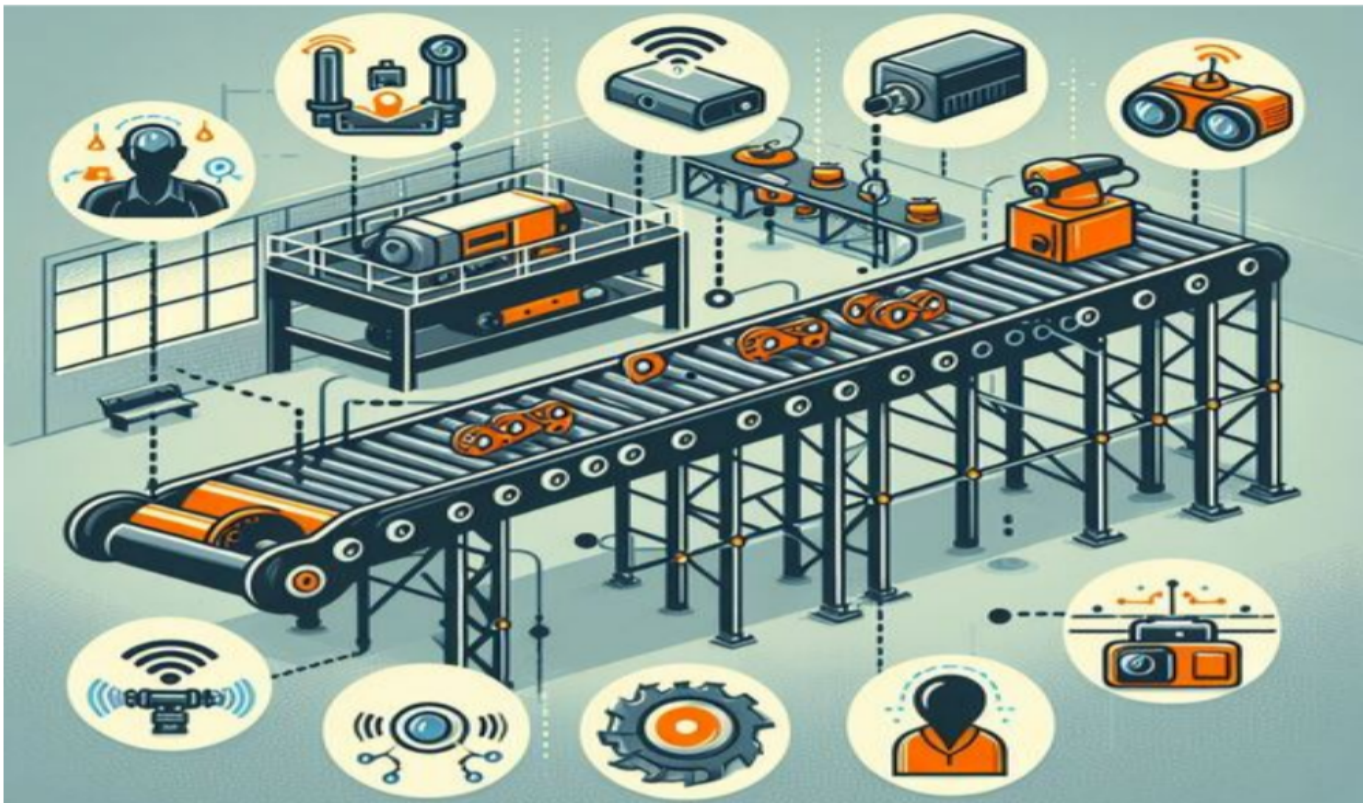

Fundamentals of Low Cost Automation in Manufacturing Process

Unit Code: ASC/N6464

Version: 1.0

NSQF Level: 5.5

Automotive Skills Development Council || 153, GF, Okhla Industrial Area, Phase 3
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Description

An Individual Primary responsibility is to design, implement, and maintain cost-effective automation solutions to optimize production processes & will collaborate with cross-functional teams, including production, engineering, and maintenance, to identify opportunities for automation and implement solutions that enhance efficiency and reduce production costs

Scope

The scope covers the following :

- Conduct & evaluate the technology analysis of Existing Manufacturing Process.
- Select & Design the System & Components of Low-Cost automation System.
- Install & Integrate with Existing Manufacturing System.
- Test & Optimize the Low-Cost Automation System

Elements and Performance Criteria

Conduct & Evaluate the technology analysis of Existing Manufacturing Process

To be competent, the user/individual on the job must be able to:

PC1. Conduct detailed analysis of existing manufacturing processes to identify areas suitable for automation

PC2. Evaluate the potential for cost savings through the introduction of low-cost automation elements

PC3. Research and evaluate cost-effective automation technologies relevant to automotive manufacturing.

PC4. Assess the feasibility and return on investment (ROI) of implementing specific automation solutions

Select & Design the System & Components of Low Cost automation System

To be competent, the user/individual on the job must be able to:

PC5. Develop detailed designs for automation systems, considering cost constraints and manufacturing requirements

PC6. Ensure that the designed systems align with safety standards and regulatory compliance

PC7. Select cost-effective components and technologies for automation systems, considering compatibility and integration requirements.

PC8. Collaborate with vendors to identify affordable and reliable automation solutions

Install & Integrate with Existing Manufacturing System

To be competent, the user/individual on the job must be able to:

PC9. Develop control software for automated systems, including Programmable Logic Controllers (PLCs) and Human-Machine Interfaces (HMIs).

PC10. Install Automation Elements as per Design Document

PC11. Configure and program robotic systems, conveyors, and other automation elements

PC12. Collaborate with cross-functional teams to integrate low-cost automation elements into the existing manufacturing infrastructure

PC13. Ensure seamless interoperability and minimal disruption to ongoing production processes.

Test & Optimize the Low Cost Automation System

To be competent, the user/individual on the job must be able to:

PC14. Conduct comprehensive testing of automation systems to ensure reliability, accuracy, and safety

PC15. Optimize automation processes to maximize efficiency, minimize cycle times, and reduce downtime

PC16. Create and maintain detailed documentation, including design specifications, programming code, and integration plans

PC17. Stay informed about advancements in low-cost automation technologies and propose continuous improvement initiatives

PC18. Ensure compliance with relevant industry regulations and ethical guidelines.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Organization procedures for health, safety and security, individual role and responsibilities in this context.

KU2. Organizations emergency procedures for different emergency situations and the importance of following the same

KU3. Understanding of various manufacturing processes in the automotive industry, including assembly lines, machining, and quality control.

KU4. Insight into the sequence and intricacies of production processes to identify opportunities for automation.

KU5. Familiarity with a range of automation technologies such as Programmable Logic Controllers (PLCs), robotics, sensors, and actuators.

KU6. Ability to assess the suitability and limitations of different automation technologies for specific manufacturing tasks.

KU7. Understanding of mechanical systems, electrical components, and how they integrate into automation solutions.

KU8. Ability to design and troubleshoot mechanical and electrical systems used in automated manufacturing.

KU9. Understanding of control system theory and principles.

KU10. Understanding of cost structures and budgeting in manufacturing

KU11. Familiarity with safety standards and regulations applicable to industrial automation.

KU12. Understanding of quality control measures in manufacturing Devices.

KU13. Awareness of Industry 4.0 concepts and emerging technologies in automation.

KU14. Awareness of ethical considerations in automation, including social and environmental impact.

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. read safety instructions/guidelines

GS2. modify work practices to improve them

GS3. work with supervisors/team members to carry out work related tasks

GS4. Complete tasks efficiently and accurately within stipulated time

GS5. inform/report to concerned person in case of any problem
GS6. make timely decisions for efficient utilization of recourses
GS7. write reports such as accident report, in at least English/regional language

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Conduct & Evaluate the technology analysis of Existing Manufacturing Process	**8**	**10**	**-**	**5**
PC1. Conduct detailed analysis of existing manufacturing processes to identify areas suitable for automation	2	2	-	1
PC2. Evaluate the potential for cost savings through the introduction of low-cost automation elements	2	2	-	2
PC3. Research and evaluate cost-effective automation technologies relevant to automotive manufacturing.	2	3	-	1
PC4. Assess the feasibility and return on investment (ROI) of implementing specific automation solutions	2	3	-	1
Select & Design the System & Components of Low Cost automation System	**10**	**12**	**-**	**5**
PC5. Develop detailed designs for automation systems, considering cost constraints and manufacturing requirements	3	3	-	2
PC6. Ensure that the designed systems align with safety standards and regulatory compliance	3	3	-	1
PC7. Select cost-effective components and technologies for automation systems, considering compatibility and integration requirements.	2	3	-	1
PC8. Collaborate with vendors to identify affordable and reliable automation solutions	2	3	-	1
Install & Integrate with Existing Manufacturing System	**13**	**10**	**-**	**5**
PC9. Develop control software for automated systems, including Programmable Logic Controllers (PLCs) and Human-Machine Interfaces (HMIs).	2	2	-	1
PC10. Install Automation Elements as per Design Document	3	2	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. Configure and program robotic systems, conveyors, and other automation elements	3	2	-	1
PC12. Collaborate with cross-functional teams to integrate low-cost automation elements into the existing manufacturing infrastructure	2	2	-	1
PC13. Ensure seamless interoperability and minimal disruption to ongoing production processes.	3	2	-	1
Test & Optimize the Low Cost Automation System	**9**	**8**	**-**	**5**
PC14. Conduct comprehensive testing of automation systems to ensure reliability, accuracy, and safety	2	2	-	1
PC15. Optimize automation processes to maximize efficiency, minimize cycle times, and reduce downtime	2	2	-	1
PC16. Create and maintain detailed documentation, including design specifications, programming code, and integration plans	2	2	-	1
PC17. Stay informed about advancements in low-cost automation technologies and propose continuous improvement initiatives	1	1	-	1
PC18. Ensure compliance with relevant industry regulations and ethical guidelines.	2	1	-	1
NOS Total	**40**	**40**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N6464
NOS Name	Fundamentals of Low Cost Automation in Manufacturing Process
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Production Engineering
NSQF Level	5.5
Credits	2
Minimum Educational Qualification & Experience	Pursuing 3rd year of UG (In trades: Manufacturing/Mechanical/Automobile/Electrical/Electronic or relevant) and continuous education) OR Completed 2nd year of UG (UG Diploma) (In trades: Manufacturing/Mechanical/Automobile/Electrical/Electronic or relevant)
Version	1.0
Last Reviewed Date	NA
Next Review Date	NA
CCN Category	1