PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: Master of Technology Specialization: Production Engineering Semester –II

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External	Internal	Total
MTPE2101	Quality and Reliability Engineering	3	1	-			Min: 40 (D Grade)	Nil	Nil	Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional – Max Marks: Nil	Assignment / Quiz/Attendance Max. Marks: Nil

Pre-Requisite	Nil
Course Outcome	1. Attain the basic techniques of quality improvement, fundamental knowledge of statistics and probability
	2. Use control charts to analyze for improving the process quality.
	3. Understand the concepts of reliability and maintainability

Unit	Contents (Theory)	Marks Weightage
I	**Basic Concepts**: Definitions of quality and Reliability, Parameters and Characteristics, Quality control, statistical Quality Control, Reliability concepts	**14**
II	**Concepts in Probability and Statistics :** Events, Sample Space, Probability rules, Conditional probability, Dependent and Independent Events, Application of Probability concepts in Quality Control, Problems	**14**
III	**Control Charts:** Variable Chart – X Bar chart, R-chart and Sigma chart. Attribute Chart : P – Chart, NP Chart, C Chart and U – Chart.	**14**
IV	**Failure Data Analysis :** Introduction, Failure Data, Quantitative measures, MTTF, MTBF, Bathtub Curve, Mean Life, Life Testing, Problems, Introduction to Failure Mode and Effect Analysis.	**14**
V	**Reliability Improvement and Allocation :** Difficulty in achieving reliability, Methods for improving reliability during design, Different techniques available to improve reliability, Optimization, Reliability-Cost trade off, Prediction and Analysis, Problems.	**14**

Text Book/References Books/ Websites:

1. J.M Juran and Gryna; Quality Planning and Analysis; Tata McGraw Hill publishing Company.
2. W.G Ireson and Cooms; Maintainability and Reliability Handbook of Reliability Engineering and Management; C.F. McGraw - Hill Book Company.
3. L S Srinath; Concepts in Reliability Engineering; Affiliated East-West Press Private Limited.
4. Charles Ebeling ; An Introduction to Reliability and Maintainability Engineering; Tata Mcgraw Hill.
5. A K Govil, Reliability Engineering by Prentice Hall.

Suggested List of Laboratory Experiments :- (Expandable): Nil

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PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: Master of Technology Specialization: Production Engineering Semester –II

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External	Internal	Total
MTPE2102	Virtual Design and Manufacturing	3	1	-			Min: 40 (D Grade)	Nil	Nil	Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional – Max Marks: Nil	Assignment / Quiz/Attendance Max. Marks: Nil

Pre-Requisite	Nil
Course Outcome	1. Understand the importance of pre design of product by different software.
	2. Analyze the manufacturability of a part or product as well as evaluate and validate production processes, machinery, operators and technicians on production systems.

Unit	Contents (Theory)	Marks Weightage
I	**Review of Computer Graphics:** Review of Computer Graphics, 2D Graphics.2D Primitives and Transformations. Algorithm to Digitize the Graphic Entities, Rasterization, 3D Graphics. 3D Primitives and Transformations, Projections and Viewing, Algorithms for hidden line removals, Lighting, Shading and Ray Tracing.	**14**
II	**VR Devices:** Input Devices-Track Balls, 3D Mouse, Data Gloves, Virtual hand and trackers, Output Devices Graph Terminal, Stereo Glasses, Head Mounting Devices, Vision Dome, Caves.	**14**
III	**Applications:** Virtual Prototyping, Behavior Simulation, Digital Mockup, Walk Through/Flythrough. Virtual Training/Simulation, Micro Electro Mechanical Systems and Nanotechnology.	**14**
IV	**Virtual Modeling Language:** History, Concepts, Syntax, Basic Nodes-Group, Transform Switch, LOD etc, Geometry Nodes-Indexed Face Set, Indexed Line Set, Coordinate, Coordindex, Textures etc. Sensor Nodes-Time Sensor Touch Sensor, Sphere Sensor, Cylinder Sensor and Proximity Sensor, Scraping- VRML Script and JAVA Script.	**14**
V	**Tutorials and Samples:** VRML Authoring Tools-3D Studio MAX, Cosmo World, VRML Pad (editor) VRML Viewing Tools-Cosmo Player, Auto Vue, SGI's Open Inventor, Virtual Collaborative Tools-V Collaboration.	**14**

Text Book/References Books/ Websites:

1. Janes D,Foley et al; Computer Graphics-Principles and practice, Second edition.
2. Jed Hartman and Josie wernecke; The VRML- 2.0 Hand book by Addision-Wesley.
3. R Carey and G Bell; The Annocated VRML 2.0 hand book Addision by Wesley.

Suggested List of Laboratory Experiments :- (Expandable)

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Programme: Master of Technology Specialization: Production Engineering Semester –II

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External	Internal	Total
MTPE2103	Lean Manufacturing Systems	3	1	-			Min: 40 (D Grade)	Nil	Nil	Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional – Max Marks: Nil	Assignment / Quiz/Attendance Max. Marks: Nil

Pre-Requisite	Nil
Course Outcome	1. To understand the importance of manufacturing techniques for optimization.
	2. To understand the concepts of lean manufacturing and profitability.

Unit	Contents (Theory)	Marks Weightage
I	**Just in Time Production System**: JIT Logic -Pull System Japanese Approach to Production Elimination of Waste, JIT Implementation Requirements JIT Application for Job Shops, Case Studies.	**14**
II	**The Rise of Lean Production**: - Birth Place, Concrete Example, Company as Community, Final Assembly Plant, Product Development and Engineering. Changing Customer Demand, Dealing with the Customer, Future of Lean Production.	**14**
III	**Shortening of production lead times:** reduction of setup times, practical procedures for reducing setup time. **Standardization of operations:** Machine layout, multi function workers and job rotation. Improvement activities to reduce work force and increase worker morale -foundation for improvements.	**14**
IV	**Elements of lean production:** Toyota Takaoka Mass Production V /s lean production, diffusing lean production. **Managing lean enterprise:** Finance, Career ladders, geographic spread and advantages of global enterprise.	**14**
V	**Prospects for catching up. Simplicity in the natural state**: institutional factors -life time employment –educational commodities -quality & productivity in full circle.	**14**

Text Book/References Books/ Websites:

1. Chasel Aquilino; Productions and Operations Management; Dreamtech latest edition.
2. Yasuhiro Monden; Toyota Production System -An integrated approach to Just in Time; Engineering Ailed Management Press.
4. Richard Schourberger; Japanese Manufacturing Techniques; the Nine Hidden Lessons.
5. James Bossert; Quality Function Development; ASQC.

Suggested List of Laboratory Experiments :- (Expandable)-Nil

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(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: Master of Technology Specialization: Production Engineering Semester –II

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTPE202	Industrial Design & Ergonomics	3	1	-	(70)	(30)	Min: 40 (D Grade)	Nil	Nil	Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional – Max Marks: Nil	Assignment / Quiz/Attendance Max. Marks: Nil

Pre-Requisite	Nil
Course Outcome	1. To understand design concept with respect to industry requirement.
	2. To able the integrating knowledge of design along with other aspects of value addition in the conceptualization and manufacturing stage of various products.
	3. To understand the need for optimization of resources and its significance.

Unit	Contents (Theory)	Marks Weightage
I	**Introduction:** An approach to industrial design -elements of design structure for industrial Design in Engineering Application in modern manufacturing systems. **Ergonomics and Industrial Design:** General Approach to the Man- Machine Relationship- Workstation Design-Working Position.	**14**
II	**Control and Displays:** Shapes and sizes of Various Controls and Displays-Multiple, Displays and Control Situations -Design of Major Controls in Automobiles, Machine Tools etc. Design of furniture -Redesign of instruments.	**14**
III	**Ergonomics and Production:** ergonomics and Product Design, Ergonomics in Automated Systems- Expert Systems for ergonomic design. Anthropometric data and its applications in Ergonomic, Design- Limitations of Anthropometric Data Use of computerized database. **Visual Effects of Line and Form:** The mechanics of Seeing- Psychology of Seeing General influences of line and Form.	**14**
IV	**Color:** Color and light -color and objects- color and the eye -color consistency- color terms- Reactions to color and Color Continuation -color on engineering equipments. **Aesthetic Concepts:** Concept of unity- concept of order with Variety -Concept of purpose Style and Environment- Aesthetic expressions. Style-Components of style- house style, observation style in capital goods, case study.	**14**
V	**Industrial Design in Practice:** General Design -Specifying Design Equipments- Rating the importance of Industrial Design -Industrial Design in the Design Process.	**14**

Text Book/References Books/ Websites:

1. Mayall W.H, Industrial Design for Engineers by London Hiffee books Ltd.
2. Brain Shakel (Edited), Applied Ergonomics Hand Book by Butterworth scientific. London.
3. R. C. Bridger, Introduction to Ergonomics by McGraw Hill Publications .
4. Sanders & McCormick, Human Factor Engineering by McGraw Hill Publications.

Suggested List of Laboratory Experiments :- (Expandable)-Nil

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Programme: Master of Technology Specialization: Production Engineering Semester –II

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External	Internal	Total
MTPE203	Thermo Fabrication Processes	3	1	-			Min: 40 (D Grade)	Nil	Nil	Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional – Max Marks: Nil	Assignment / Quiz/Attendance Max. Marks: Nil

Pre-Requisite	Basic knowledge of Thermodynamics and Production Engineering.
Course Outcome	1. To understand metal joining process by heat.
	2. Classify various types of Engines, to compare Air standard, Fuel Air and Actual cycles also make out various losses in real cycles.

Unit	Contents (Theory)	Marks Weightage
I	**Introduction:** Need and Classifications of Thermo fabrication Processes**;** **Metal casting:** Need and Limitations; Classification of Casting Processes; Sand Mould Casting: Classification of Foundry Sands; Composition, Properties and Testing of Moulding Sand Preparation of Metal Mould.	**14**
II	**Design of Pattern and Core:** Parting Line Design; Gating System Design-Types of Gating Systems; Design of Pouring Basin, Sprue, Runner and Ingate; Mould filling velocity and Time including friction and Velocity Distribution in the Conduit.	**14**
III	**Casting Precision:** Determination of Solidification time of Castings; Riser Design and Placement; Description of Precision Sand Mould Casting Processes; Metal Mould Casting, Determination of Solidification Time of castings; Description of Die Casting, Centrifugal Casting and Continuous Casting.	**14**
IV	**Metal Welding:** Need and Limitations; Classification and types of Welding Processes; Arc Welding- Characteristics of Arc and Mode of Metal Transfer; Welding fluxes and coatings; Defects and Inspection of welds; Weld Cracking and Prevention.	**14**
V	**Powder Metallurgy:** Production of Metal Powders; Blending and Mixing; Compacting and Sintering; Densification and Sizing; Impregnation and Infiltration; Advances in Powder Metallurgy-Isocratic Pressing, Hot Pressing and Spark Sintering.	**14**

Text Book/References Books/ Websites:

1. John Stark, Springer; Product Lifecycle Management Paradigm for century Product Realizatio; Verlag.
2. Zeid; CAD/CAM Theory and Practice; Mc Graw Hill.
3. Mark Henderson & Philip Wolfe; Computer Integrated Design and Manufacturing; Bedworth Mc Grawhill.
4. Sanders & McCormick; Part modeling Users Guide.

Suggested List of Laboratory Experiments :- (Expandable)-Nil

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Programme: Master of Technology Specialization: Production Engineering Semester –II

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTPE204	Maintenance Engineering	3	1	-	(70)	(30)	Min: 40 (D Grade)	Nil	Nil	Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional – Max Marks: Nil	Assignment / Quiz/Attendance Max. Marks: Nil

Pre-Requisite	Nil
Course Outcome	1. To be aware about maintenance during working machines.
	2. Understand the importance of the maintenance and process improvement functions within industry.
	3. Understand the different statistical methods available for analysis of different processes.

Unit	Contents (Theory)	Marks Weightage
I	**Introduction :** Maintenance, Need of Maintenance Management, Maintenance Policies, Strategies and options in Maintenance Management. Maintenance forms/actions and their inter relationships.	**14**
II	**Maintenance Planning and Control:** Establishing a Maintenance Plan-Preliminary considerations, Systematic Method of Maintenance Plan, Schedule Planning and schedule of Plant shut downs.	**14**
III	**Brief Descriptions of Various Maintenance Actions:** Maintenance Organizations, Prerequisites, Factors determining effectiveness of a Maintenance organization, objectives of organization design, types of organization.	**14**
IV	**Spare Parts Management**: Capacity utilization, cost reduction approach to spares, reliability and Quality of Spares, Spare Parts Procurement, and Inventory Control of Spare Parts.	**14**
V	**Maintenance Practices on Production Machines:** Lathe, Drilling, Milling, Welding, and Shaper, Use of Computer in maintenance, Machine Reconditioning, Evaluation of Maintenance Management, Need for evaluation, Criterion of Evaluation.	**14**

Text Book/References Books/ Websites:

1. Strategies and Options, Maintenance Management Policies, Lecture notes MACT, Bhopal.
2. P. Gopal Krishnan & A.K. Banerji, Maintenance & Spare Parts Management.
3. W. Grant Ireson and Clyde F; Hand Book of Reliability Engineering & Management; McGraw Hill.
4. Anthony Kelley; Maintenance Planning & Control, East West Press.

Suggested List of Laboratory Experiments :- (Expandable)-Nil

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Programme: Master of Technology Specialization: Production Engineering Semester –II

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External	Internal	Total
MTPE205	Rapid Prototyping	3	1	-			Min: 40 (D Grade)	Nil	Nil	Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional – Max Marks: Nil	Assignment / Quiz/ Attendance Max. Marks: Nil

Pre-Requisite	Nil
Course Outcome	1. Describe product development, conceptual design and classify rapid prototyping systems; explain stereo lithography process and applications.
	2. To understand the direct metal laser sintering and fusion deposition modeling processes.

Unit	Contents (Theory)	Marks Weightage
I	**Introduction:** Need for the Compression in Product Development, History of RP systems, Survey of applications, Growth of RP Industry, and Classification of RP systems. **Stereo Lithography Systems:** Principle, Process Parameter, Process details, Data Preparation, data files and machine details, Application.	**14**
II	**Selective Laser Sintering and Fusion Deposition Modeling:** Type of machine, Principle of operation, process parameters, Data preparation for SLS, Applications, Principle of Fusion deposition modeling, Process parameter, Path generation, Applications	**14**
III	**Laminated Object Manufacturing:** Principle of operation, LOM materials. Process details, application. **Concepts Modelers:** Principle, Thermal jet printer, Sander's Model Market, 3-D printer. Genisys Xs printer HP System 5, Object Quadra systems.	**14**
IV	**Rapid Tooling:** Indirect Rapid tooling -Silicone rubber tooling –Aluminum Filled Epoxy Tooling Spray Metal Tooling, 3Q keltool, etc. Direct Rapid Tooling Direct. AIM, Quick cast process, Copper polyamide, Rapid Tool, DMILS, Prometal, Sand Casting Tooling, Laminate tooling soft Tooling vs. hard tooling.	**14**
V	**RP Process Optimization:** Factors Influencing Accuracy, Data Preparation Errors, Part Building Errors, Error in finishing, Influence of Build Orientation.	**14**

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Text Book/References Books/ Websites:

1. Paul F. Jacobs; Stereo lithography and other RP & M Technologies; SME, NY.
2. D.T Flham & S.S Dinjoy; Rapid Manufacturing ; Verlog.
3. Lament wood; Rapid automated ; Indus press New York.
4. Terry Wohlers, Wohler's Report 2000 ; Wohler's Association.

Suggested List of Laboratory Experiments :- (Expandable)-Nil

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Programme: Master of Technology Specialization: Production Engineering Semester –II

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total	External	Internal	Total (100)
MTPE206	Manufacturing Technique Lab	-	-	2	(Nil)	(Nil)	Nil	(70)	(30)	Min: 40 (D Grade)

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance Max. Marks: Nil
Practical Internal Max Marks: 30	Lab work & Sessional – Max Marks: 15	Assignment / Quiz Attendance Max. Marks: 15

Pre-Requisite	Nil
Course Outcome	1. Able to understand the appropriate manufacturing processes in the manufacture of a product at the design stage.
	2. Able to understand the concept of a product design specification (PDS), and be able to indicate few factors which should be included in producing one.

Unit	Contents (Theory)	Marks Weightage
	Students will study the different operations of Mechanical workshop such as Different Welding Types, Flux, Welding Defect, Removal of Welding Defects, Casting Process, Green sand Mould, forging, Rolling, Brazing.	**100**

Text Book/References Books/ Websites:

1. Mikell P. Groover, Fundamental of Modem Manufacturing by Materials, Processes and Systems.
2. G. K. Lal&S, Fundamental of Manufacturing by K. Choudhury.
3. E. P. DeGarmo, Materials &Processes in Manufacturin by T. Black and Kohser.
4. S. Kalpakjian by Manufacturing Engineering &Technology.
5. E. P. Degarmo, Materials &Processes in Manufacturing, by Macmilla.

Suggested List of Laboratory Experiments :- (Expandable):

1. To prepare a mould for a given single piece pattern.
2. To prepare a green mould for casting using only two boxes.
3. To observe the melting of metals to prepare the casting.
4. To prepare a split wooden pattern detailed below with allowance.
5. To conduct arc welding and study the effect of polarity on weld strength and heat effected zone.
6. To study the effect of AC current on weld strength and heat affected zone in Arc welding.
7. To study the effect of the current on weld strength-using spot welding process.
8. To join two sheets by brazing process.
9. To Prepare a Plastic product using Injection Moulding machine.
10. To Join two given work pieces using plasma arc welding and Brazing and cut the given plate into two parts using plasma cutting.

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(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: Master of Technology Specialization: Production Engineering Semester –II

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total	External	Internal	Total (100)
MTPE207	Maintenance Policy and Repair Lab	-	-	2	(Nil)	(Nil)	Nil	(70)	(30)	Min: 40 (D Grade)

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance Max. Marks: Nil
Practical Internal Max Marks: 30	Lab work & Sessional – Max Marks: 15	Assignment / Quiz Attendance Max. Marks: 15

Pre-Requisite	Nil
Course Outcome	1. To be aware about maintenance during working machines.
	2. Understand the importance of the maintenance and process improvement functions within industry.
	3. Understand the different statistical methods available for analysis of different processes.

Unit	Contents (Theory)	Marks Weightage
	Objectives and Functions of Maintenance. Factors influencing plant availability, Maintenance control, Maintenance Strategies, Organization for Maintenance. Failure Statistics: Breakdown time distributions, Running-in failures, Time independent failures, Wear-out failures, Failure Probability, Survival Probability and age specific failure rates.	**100**

Text Book/References Books/ Websites:

1. A Kelly and M J Harris, "Management of Industrial Maintenance", Butterworth's Co, Ltd.
2. Aks Jardine "Maintenance, Replacement and Reliability" Pitman publishing Co.
3. A Kelly, "Maintenance planning and control", Butterworth Co, Ltd.
4. Fuller, D., Theory and Practice of Lubrication for Engineers, New York Company.
5. Moore, Principles and Applications of Tribiology, by Pergamaon press.

Suggested List of Laboratory Experiments :- (Expandable):

1. Objectives and Functions of maintenance
2. Study of Overhauling and Repair in Maintenance Process.
3. Study of Different Maintenance Systems.
4. Study of Shut down planning using CPM & PERT.
5. Study of Behavior of Tribological Components:

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (50)	External	Internal	Total
MT208	Audit Course - II (English For Research Paper Writing)	-	-	-	(35)	(15)	Min: 20 (D Grade)	Nil	Nil	Nil

Duration of Theory (Externals): 2 Hours

Theory Internal- Max Marks: 15	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional – Max Marks: Nil	Assignment / Quiz Max. Marks: Nil

Pre-Requisite	Nil
Course Outcome	1. Student will understand that how to improve your writing skills and level of readability.
	2. Learn about what to write in each section of research article.
	3. Understand the skills needed when writing a Title.

Unit	Contents (Theory)	Marks Weightage
I	Planning and Preparation; Word Order; Breaking up long sentences; Structuring Paragraphs and Sentences; Being Concise and Removing; Redundancy; Avoiding Ambiguity and Vagueness.	**07**
II	Clarifying Who Did What; Highlighting Your Findings; Hedging and Criticizing; Paraphrasing and Plagiarism; Sections of a Paper; Abstracts; Introduction.	**07**
III	Review of the Literature; Methods; Results; Discussion; Conclusions; The Final Check.	**07**
IV	Key skills are needed when writing a Title; key skills are needed when writing an Abstract; key skills are needed when writing an Introduction; skills needed when writing a Review of the Literature.	**07**
V	Skills are needed when writing the Methods; skills needed when writing the Results; skills are needed when writing the Discussion; skills are needed when writing the Conclusions; useful phrases; how to ensure paper is as good as it could possibly be the first- time submission	**07**

Text Book/References Books/ Websites:

1. R. Goldbort (2006) Writing for Science; Yale University Press (available on Google Books).
2. R. Day (2006) How to Write and Publish a Scientific Paper; Cambridge University Press
3. N Highman (1998); Handbook of Writing for the Mathematical Sciences; SIAM. Highman's book
4. Adrian Wallwork ; English for Writing Research Papers; Springer New York Dordrecht Heidelberg London; 2011

Suggested List of Laboratory Experiments :- (Expandable): Nil

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