PERIYAR UNIVERSITY
SALEM 638 011

PERIYAR INSTITUTE OF DISTANCE EDUCATIONS (PRIDE)
P.G. DIPLOMA IN COMPUTER AIDED MANUFACTURING
ONE YEAR PROGRAMME
NON SEMESTER
REGULATIONS AND SYLLABUS
(Effective from the Academic year 2007-2008 and thereafter)

1
PERIYAR UNIVERSITY, SALEM - 11
PERIYAR INSTITUTE OF DISTANCE EDUCATIONS
PRIDE
PG DIPLOMA IN COMPUTER AIDED MANUFACTURING
(PGDCAM)
ONE YEAR PROGRAMME

Regulations

Effective from the Academic year 2007 – 2008 and thereafter

1. CONDITION FOR ADMISSION

The candidate who has passed B.Sc. Computer Science, B.C.A., B.Sc. Information Science, and B.Sc. Information Technology of this University or Any degree with diploma in CAD/CAM/CA or any other University accepted by the syndicate as equivalent thereto subject to such conditions as may be prescribed therefore shall be permitted to appear and qualify for the P.G. Diploma in CAM degree Examination of this University after a course of one academic year.

2. DURATION OF THE COURSE

The course for the P.G. Diploma in COMPUTER AIDED MANUFACTURING shall consist of one Academic year.
3. COURSE OF STUDY

The Course of Study shall comprise instruction in the following subjects according to the syllabus and books prescribed from time to time.

1. MACHINE DRAWING
2. MACHINE SHOP TECHNOLOGY
3. ROBOTICS
4. ENTREPRENEURSHIP DEVELOPMENT
5. COMPUTER AIDED MANUFACTURING
6. MECHATRONICS
7. HYDRAULICS AND PNEUMATIC SYSTEMS
8. MANUFACTURING PROCESS
9. PRACTICAL I: AUTOCAD LABORATORY
10. PRACTICAL II: CAM and CNC LABORATORY
11. PRACTICAL III

4. EXAMINATIONS:

The examination shall be three hours duration to each paper at the end of the year. The candidate failing in any subject(s) will be permitted to appear for each failed subject(s) in the subsequent examination.

The external examiners should conduct the practical Examinations at the end of the year.
5. SCHEME OF EXAMINATIONS

The Scheme of Examinations for different years shall be as follows:

<table>
<thead>
<tr>
<th>S. No</th>
<th>Paper Code</th>
<th>Title of the Paper</th>
<th>Exam Duration</th>
<th>Maximum Marks</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td>MACHINE DRAWING</td>
<td>3</td>
<td>100</td>
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<tr>
<td>2.</td>
<td></td>
<td>MACHINE SHOP TECHNOLOGY</td>
<td>3</td>
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<td>3.</td>
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<td>ROBOTICS</td>
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<td>4.</td>
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<td>ENTREPRENEURSHIP DEVELOPMENT</td>
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<td>5.</td>
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<td>COMPUTER AIDED MANUFACTURING</td>
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<td>6.</td>
<td></td>
<td>MECHATRONICS</td>
<td>3</td>
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<td>7.</td>
<td></td>
<td>HYDRAULICS AND PNEUMATIC SYSTEMS</td>
<td>3</td>
<td>100</td>
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<td>8.</td>
<td></td>
<td>MANUFACTURING PROCESS</td>
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<td>Practical I: AUTOCAD LABORATORY</td>
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<tr>
<td>10.</td>
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<td>Practical II: CAM and CNC LABORATORY</td>
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<td>11.</td>
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<td>Practical III</td>
<td>3</td>
<td>100</td>
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Total : 1100
6. QUESTION PAPER PATTERN

a. For Theory

Time: 3 Hours  
Max. Marks: 100  
Passing Min : 50

**PART – A: 5X5 = 25**

(Answer all Questions)
(Two Questions from each unit with Internal Choice)

**PART – B: 5X15 = 75**

(Answer all Questions)
(Two Questions from each unit with Internal Choice)

b. For Practical

Time: 3 Hours  
Max. Marks : 100  
Passing Min : 50

One / Two Compulsory Problem(s) to be solved within 3 hours.

c. Distribution of the marks

Practical :
- For Writing procedures/programs in the main answer book 40%
- For listing and debugging 40%
- For correct and formatted output 20%
7. PASSING MINIMUM

The candidate shall be declared to have passed the examinations in a Theory/practical of study only if he/she secures not less than 50% of the total prescribed marks for the subject in the University Examinations.

8. CLASSIFICATION OF SUCCESSFUL CANDIDATES

Candidates who secure not less than 60% of the aggregate marks in the whole examination shall be declared to have passed the examination in **First Class**. All other successful candidates shall be declared to have passed in **Second Class**. Candidates who obtain 75% of the marks in the aggregate shall be deemed to have passed the examination in **First Class with Distinction** provided they pass all the examinations prescribed for the course at the first appearance.

9. COMMENCEMENT OF THIS REGULATION:

These regulations shall take effect from the academic year 2007-08, i.e., for students who are admitted to the first year of the course during the academic year 2007-08 and thereafter.
1. MACHINE DRAWING

UNIT - I SECTION VIEWS:
Introductions – need for sectioning – Hatching – Inclination of hatching lines – Spacing hatching lines – Hatching of larger areas – Hatching of adjacent parts – sketch and of full section, Half sections – types, Partial or local sections, Revolved or super imposed, Removed sections and offset sections.

UNIT - II LIMITS, FITS AND TOLERANCES
Introduction – Definition of various terms used in limits – Hole basis system – Shaft basis system –Types of fits – Selection of fits and applications – types of tolerances – form and position – Indication of tolerances and fits on the drawing.

UNIT – III KEYS AND SURFACE FINISH

UNIT - IV SCREW THREADS AND THREADED FASTENERS

TEXT BOOKS

REFERENCE BOOK
2. MACHINE SHOP TECHNOLOGY

UNIT-I:
**Planer:** Types of planers—description of double housing planer—specifications—principles of operation—drives—quick return mechanism—feed mechanism—types—work holding devices—special fixtures—types of tools—various operation.
**Shaper:** Types of shapes—specifications—standard—plain—universal—principles of operations—drives—quick return mechanism—crank and slotted link—feed mechanism—work holding devices—tools and fixtures.
**Slotter:** Types of slotters—specifications—method of operation—Whitworth quick return mechanism—feed mechanism—work holding devices—tools and fixtures.

UNIT -II:

UNIT-III:
**Grinding machines:** Types and classification—specifications—rough grinders—floor mounted hand grinders—portable grinders—belt grinders—precision grinders—cylindrical surface—centre less grinders—internal grinders—planetary grinders—principles of operations—grinding wheels—abrasives—natural and artificial—dressing and truing of wheels.
**Broaching:** Types of broaching machine—horizontal vertical and continuous broaching—principles of operation—types of broaches—classification—broach tool nomenclature—broaching operations—simple examples.
**Boring and Jig boring:** Boring machines—horizontal and vertical types—fine boring machines—boring tools—jig boring machine—measuring system—hole location procedure—deep hole boring.
UNIT-IV:
Gear manufacturing practice-Forming and Generating processes:

UNIT-V:
Jigs and Fixtures:Definitions and concept of Jig and fixture-Advantages of jigs and fixtures-elements of jigs and fixtures-locating devices-'V' locators-fixed stop locators-adjustable stop locators-clamping devices-strap clamp, screw clamp-cam action clamp-types of jigs-box drill jig-indexing drill jig types of fixtures-keyway milling fixture-string milling fixture.
Non-Conventional Machining process:Ultrasonic machining-chemical machining-electro chemical grinding-electrical discharge machining-plasma arc machining-laser machining.

TEXT BOOK:
1. Elements of Workshop Technology-I& II-Hajra Choudry & Battacharya

REFERENCE BOOKS:
1. Production Technology-HMT
2. Production Tech- Jain & Gupta
4. Production processes TTTI, Chennai
3. ROBOTICS

UNIT - I:

UNIT - II:

UNIT - III:

UNIT - IV:

UNIT - V:

REFERENCE BOOKS:
4. ENTREPRENEURSHIP DEVELOPMENT

UNIT-I:

UNIT-II:

UNIT-III:

UNIT-IV:
Marketing channel – selecting channel members – setting quality standards – requirements strategies. Types of relevant institutions – entrepreneurship development programme in India - prospects.

UNIT-V:

REFERENCE BOOKS
5. COMPUTER AIDED MANUFACTURING

UNIT-I


UNIT-II


UNIT-III

Machining Centers – Turning Centres – CAD/CAM Integration – NC systems – Material Handling – Automated Guided Vehicles (AVGs).

UNIT-IV


UNIT-V


TEXT BOOK:

REFERENCES:
6. MECHATRONICS

UNIT – I : Theory of Mechatronics
Automation – definition – need, advantages and disadvantages of automation.

UNIT – II : Sensors and Transducers:

UNIT – III: Actuators
Pneumatic and Hydraulic System: Actuation systems, pneumatic and hydraulic systems, Directional control valves, Pressure control valve, Cylinders, Process control valves, Rotary actuators.
Electrical actuation systems: Electrical systems, mechanical switches, solid state switches, solenoids principle of working, types, specification and control of DC motor – AC motors , Stepper motors.

UNIT – IV: Programmable Logic Controller

UNIT – V: Industrial Design and Fault finding

TEXT BOOK:
REFERENCES:
2. Mechatronics: (Electronics In Products And Processes), A. Bradley and others - Chapman and Hall.
7. HYDRAULICS AND PNEUMATIC SYSTEMS

UNIT - I:


UNIT - II:


UNIT - III:


UNIT - IV:

UNIT - V:

Electronic control of fluid power -solenoid valves-servo valves- pump controls.

TEXT BOOKS:

2. Introduction to Fluid Power--James L. Johnson.-Delmar Thomson Learning, Inc.

REFERENCES :

8. MANUFACTURING PROCESS

UNIT – I FOUNDRY

UNIT – II FORGING AND WELDING

UNIT – III POWDER METALLURGY AND HEAT TREATMENT OF METALS
UNIT – IV LATHE WORK AND THEORY OF METAL CUTTING

UNIT – V
METROLOGY AND SEMI – AUTOMATIC AND AUTOMATIC LATHE

Semi automatic lathes:

Automatic Lathes:

REFERENCES
1. Elements of workshop Technology Volume I & II by Hajra Chowdry & Bhattacharaya.
2. Manufacturing process by Begeman.
4. Production Technology by Jain & Gupta.
5. Production Technology by P. C. SHARMA
6. HMT manual.
8. Manufacturing Engineering & Technology by Kalpakjian.
9. AUTOCAD LABORATORY

**Drawing Ex. Practice (Machine & Assembly Drawing)**

1. Sleeve and Cotter joint
2. Socket and spigot joint
3. GIB and Cotter joint
4. Flange Coupling
5. Universal Coupling
6. Machine Vice
7. Swivel Bearing
8. Screw jack
9. Tail Stock

**10. CAM and CNC LABORATORY**

**Introductions**

1. Study of CNC lathe, milling
2. Study of international standards G-Codes, M-Codes

**Exercise practice**

**CNC Lathe**

1. Develop a part program for step turning and simulate
2. Develop a part program for taper turning and simulate
3. Develop a part program for circular interpolation and simulate
4. Develop a part program for multiple turning operation and simulate
5. Develop a part program for thread cutting, grooving and simulate
6. Develop a part program for internal drills, boring and simulate

**CNC Milling**

1. Develop a part program for grooving and simulate
2. Develop a part program for drilling (canned cycle) and simulate
3. Develop a part program for mirroring with subroutines and simulate
4. Develop a part program for rectangular and circular pocketing and simulate