FARWESTERN UNIVERSITY
FACULTY OF ENGINEERING
Mahendranagar, Kanchanpur, Nepal
Syllabus for Lab Assistant (Mechanical Engineering)

Full Marks: 75
Pass marks:30
Time: 3 hrs

	1.0 Workshop Practices
1.1	Basic knowledge of measuring instruments - Scale, Tri-square, Bevel Protractor Vernier Caliper, Micrometer, Gauges and Filler gauges
1.2	Basic knowledge of Metric, FPS and SI Unit
1.3	Basic knowledge of hand tools and their applications
1.4	Basic knowledge of Lathe, Milling, Shaper, Grinding and Drilling Machine
1.5	Basic knowledge of Arc welding and Oxy-acetylene welding
1.6	Basic knowledge of power transmission in workshop
	2.0 Machine Drawing
2.1	Finding out the missing views from two given projection and dimensioning 1.1.1 Missing views of prismatic work pieces 1.1.2 Missing views of cylindrical work pieces 1.1.3 Missing views of pyramidal, conical, cylindrical cut work pieces
2.2	Isometric drawing of machine parts including sections
2.3	Drawing of joints 1.3.1 Permanent joints 1.3.2 Temporary joints 1.3.3 Drawing Exercises : Nut bolt and threaded joints; Riveted joint; Welded joints and symbols; and Gears, Keys and Spline joints 1.3.4 Orthographic projection
	3.0 Heat Engines
3.1	Different types of heat engines
3.2	Different cycles involved in heat engines
3.3	Basic difference in Steam Engine and Automotive engines
3.4	Different types of power plants (engine) used in civil Aircraft
	4.0 Thermodynamics
4.1	General 4.1.1 Boyle's law, Charles' law and combined gas law 4.1.2 Characteristics of gas constant 4.1.3 Terms used in thermodynamics
4.2	First law of thermodynamics 4.2.1 Definition of the first law 4.2.2 Total internal energy 4.2.3 Mechanical equivalent of heat engine
4.3	Second law of thermodynamics

	4.3.1 Definition of the second law 4.3.2 Thermal efficiency of heat engine
4.4	Thermodynamics Properties of Fluid (Definitions only) 4.4.1 Internal energy 4.4.2 Enthalpy 4.4.3 Entropy 4.4.4 Specific heat at constant volume 4.4.5 Specific heat at constant pressure
4.5	Basic thermodynamics process 4.5.1 Constant volume process 4.5.2 Constant pressure process 4.5.3 Constant temperature process 4.5.4 Adiabatic process 4.5.5 Polytropic process
4.6	Petrol and Diesel Engine Cycles 4.6.1 Constant volume cycle 4.6.2 Constant pressure cycle 4.6.3 Mixed cycle
	5.0 Basic Knowledge of Electro- Mechanical Principle
5.1	Basic Knowledge of AC and DC Motors
5.2	Basic Knowledge of Generator
	6.0 Applied Mechanics
6.1	Statics 6.1.1 Coplanner system of intersecting forces 6.1.2 Coplanner parallel forces, the moment of a force 6.1.3 Centre of Gravity 6.1.4 Friction
6.2	Kinematics 6.2.1 Definition of technical terms: speed, velocity, acceleration, distance traversed and their units 6.2.2 The trajectory of particles, distance and time 6.2.3 Rectilinear motion of a particle
6.3	Composition of a simple motion of a particle 6.3.1 Curvilinear motion of a particle 6.3.2 Simple motion of a solid body
6.4	Dynamics 6.4.1 Fundamental laws of dynamics: Newton's law of motion 6.4.2 Work, Energy and Power 6.4.3 Mechanical Energy 6.4.4 Relation between RPM, Torque and Power 6.4.5 Law of conservation of energy
	7.0 Servicing and Maintenance of Equipment
7.1	Basic knowledge on maintenance system
7.2	Importance of maintenance
7.3	General knowledge of different types of fuels and lubricants

7.4	Knowledge on periodic maintenance
	8.0 Welding and Sheet Metal Works
8.1	Different types of welding procedure and their applications
8.2	Welding equipment, tools, accessories and types of electrodes
8.3	Welding defects, causes and remedies
8.4	Principle, Tools, Equipment and Procedure of soldering and brazing
8.5	General Fitting - Male and Female Joints by Marking, Sawing, Chiseling, Cutting, Joining
8.6	Marking, Cutting, Folding, Bending and Joining of Sheet Metal

Type of Questions	**Number of questions**	**Marks for each questions**	**Total marks**
Subjective Type Questions	6	10	60
Objective Type Questions	15	1	15
		Total	75