NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number-	**0064066**	**-Session-1986-87**
-Superclass-	**RC**	
-Title-	**SIMPLE HARMONIC MOTION (x $^1/_2$)**	

-DESCRIPTION-

Type
and
Purpose

A <u>general</u> module ($^1/_2$) which introduces the student to the principles and applications of the laws governing simple harmonic motion.

Preferred
Entry Level

04005 Introduction to Dynamics
01086 Mathematics: Calculus (B)

Learning
Outcomes

The student should:

1. use the basic equations of simple harmonic motion;

2. apply equations of motion to a vibrating system with one degree of freedom;

3. apply equations of motion to an undamped vibrating system with one degree of freedom and with viscous damping.

Content/
Context

Corresponding to the Learning Outcomes:

1. concept of SHM and the relationship between displacement, velocity and acceleration. Amplitude, frequency and periodic time.

    Solution of problems using the basic equations.

2. degrees of freedom; stiffness, parallel and series stiffness. Mass, spring systems. Torsional and beam systems. Undamped natural frequency, one degree of freedom.

3. viscous damping; critical damping, viscous damping ratio, underdamped and overdamped systems, damped natural frequency, logarithmic decrement.

Suggested
Learning
and
Teaching
Approaches

The use of basic units and a checking procedure should be stressed throughout the module.

A systems approach should be used whenever possible.

Although formal presentation of material will form a part of the module, practical student-centred experimentation will form an integral part of the learning process. It is expected that the presentation of this material will take advantage of technical innovation.

The use of computer software is recommended for problem solving and reinforcement.

A tutorial system utilising problems of increasing difficulty should be an integral part of problem solving activities.

Principles should be reinforced by practical demonstrations, exploiting modern methods and instrumentation.

Assessment
Procedures

All learning outcomes must be validly assessed.

The student must be informed of the tasks which contribute to summative assessment. Any unsatisfactory aspects of performance should, if possible, be discussed with the student as and when they arise.

Acceptable performance in the module will be satisfactory achievement of the performance criteria specified for each learning outcome.

The following abbreviations are used below:

LO   Learning Outcomes
IA   Instrument of Assessment
PC   Performance Criteria

LO1 IA   Short answer exercise with calculations.

PC   The student:

(a)   satisfactorily outlines the relationships between the parameters involved in SHM;

(b)   from given data applies appropriate formulae and performs relevant calculations to obtain valid solutions to problems on SHM.

LO2   IA   Short answer exercise with calculations.

PC   From given data, the student applies appropriate formulae and performs relevant calculations to obtain solutions to problems on undamped vibrating systems with one degree of freedom. Problems to include parameters such as:

(a)   parallel and series stiffness;

(b)   torsional systems;

(c)   beam systems.

LO3   IA   Assignment report.

PC   The student satisfactorily:

writes a brief report of an experimental investigation on a vibrating system with one degree of freedom and with viscous damping. The report should demonstrate the application of appropriate formulae and performance of relevant calculations. Relevant conclusions should de drawn from the results.

02/10/98