Yatsuk EP.1981. *Rotary Soil Working Machines Construction, Calculation and Design*. American Publ. Co.

FMPE502 SOIL DYNAMICS IN TILLAGEANDTRACTION 2+1

Objective

To acquaint and equip with the dynamic properties of soil, soil failure and design of tillage tools, prediction of traction performance and dimensional analysis of different variables related to soil- tire system.

Theory

UNIT I

Dynamic properties of soil and their measurement, stress-strain relationships, theory of soil failure.

UNIT II

Mechanics of tillage tools and geometry of soil tool system, design parameters and performance of tillage tools.

UNIT III

Dimensional analysis of different variables related to soil-tyre system; soil vehicle models; mechanics of steering of farm tractor; special problems of wet land traction and floatation.

UNIT IV

Introduction of traction devices, tyres-types, function & size, their selection; mechanics of traction devices. Deflection between traction devices and soil, slippage and sinkage of wheels, evaluation and prediction of traction performance, design of traction and transport devices. Soil compaction by agricultural vehicles andmachines.

Practical

Relationship of soil parameters to the forces acting on tillage tools, wheel slippage and tyre selection, design and performance of traction devices and soil working tools.

Suggested readings

Daniel Hill. 1962. *Fundamentals of Soil Physics*. AcademicPress.

Gill & Vandenberg.1968. *Soil Dynamics in Tillage and Traction*. Supdt. of Documents, U.S. Govt. Printing Office, Washington,D.C.

Sineokov GN. 1965. *Design of Soil Tillage Machines*. INSDOC, New Delhi.

Terzaghi K & Peck Ralph B.1967. *Soil Mechanics in Engineering Practices*. John Wiley &Sons.