PAVEMENT EVALUATION AND MANAGEMENT (ELECTIVE – II)

Course Code: 13CE2116

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Course Educational Objectives:

1. To impart the knowledge on pavement structure and evaluation.
2. To familiarize the student with design of flexible overlays and rigid overlays.

Course Outcomes:

1. The students will demonstrate the ability to understanding pavement management systems, models and methodologies.
2. To impart the students, with the knowledge of pavement surface condition & its evaluation.
3. To impart the students, with the knowledge of pavement structure & its evaluation.
4. To impart the students, with the knowledge of pavement overlays & design.

UNIT – I

PAVEMENT SURFACE CONDITION & ITS EVALUATION: Various Aspects of Surface and their Importance; Causes, Factors Affecting, Deterioration and Measures to Reduce:

RIDING QUALITY: Measurement of Skid Resistance, Unevenness, Ruts and Cracks. Pavement Surface Condition Evaluation by Physical Measurements, by Riding Comfort and Other Methods; their Applications. Surface unevenness-Bump Integrator

UNIT – II

PAVEMENT STRUCTURE & ITS EVALUATION-I: Factors affecting Structural Condition of Flexible and Rigid Pavements; Effects of Sub grade Soil, Moisture, Pavement Layers, Temperature, Environment and Traffic on Structural Stability, Pavement Deterioration.

PAVEMENT STRUCTURE & ITS EVALUATION-II: Evaluation by Non-Destructive Tests such as FWD, Benkelman Beam Rebound Deflection, Plate Load Test, Wave Propogation and other methods of Load Tests; Evaluation by Destructive Test Methods, and Specimen Testing

UNIT – III

PAVEMENT OVERLAYS & DESIGN-I: Pavement Overlays, Design of Flexible Overlay over Flexible Pavement by Benkelman Beam Deflection and other Methods.

UNIT – IV

PAVEMENT OVERLAYS & DESIGN-II: Flexible Overlays and Rigid Overlays over Rigid Pavements, Use of Geo-synthetics in Pavement Overlays.

UNIT – V

PAVEMENT MANAGEMENT SYSTEM: Concepts of pavement management systems, pavement performance prediction – concepts, modeling techniques, structural conditional deterioration models, HDM.

MODELS AND METHODOLOGIES: Mechanistic & empirical models, functional condition deterioration models, unevenness deterioration models and other models, ranking and optimization methodologies.

TEXT BOOKS

1. Yoder E.J. and Witzak, *"Principles of Pavement Design"*, 2nd Edition, John Wiley and Sons, 1975.
2. Shahin, M Y, *"Pavement Management for Airport, Roads and Parking lots"*, 1st Edition, Chapman and Hall, , 1994.
3. Huang, Yang H., *"Pavement Analysis and Design"*, 3rd Edition, Prentice Hall, 2009.

REFERENCES

1. Babkov, *"Road Conditions and Traffic Safety"*, 1st Edition, Mir Publications, 1975.
2. Woods, K.B., *"Highway Engineering Hand Book*", 1st Edition, McGraw Hill Book Co., 1960.
3. David Croney, "*The Design and Performance of Road Pavements"*, 2nd Edition, HMSO Publications, 1991
4. Haas and Hudson, *"Pavement Management System"*, 2nd Edition, McGraw Hill Book Co., New York, , 1978
5. Per Ullitz, *"Pavement Analysis"*, 1st Edition, Elsevier, Amsterdam, 1987.
6. HRB/TRB/IRC/International Conference on Structural Design of Asphalt Pavements, 2000.