

## Course syllabus

Department of Civil Engineering, Indian Institute of Technology Madras

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### **CE5591 - Pavement Preservation and Environmental Impact Assessment of Recycled Materials in Pavement Management**

**Credit Distribution:** C:3 L:1 T:0 P:0 E:0 O:2 TH:3

**Course Type:** Theory

**Description:** i) Exposing the participants to the fundamentals of the pavement management systems (PMS) ii) Describing the basic theoretical and practical aspects of recycling of asphalt pavements (RAP) iii) Discussing the aspects of pavement life cycle where RAP is being employed ? iv) Exposing the participants to practical problems and technical issues with the use of RAP v) Exposing the participants to the concept of pavement preservation techniques vi) Discussing the aspects of pavement life cycle where pavement preservation techniques have been utilized

**Course Content:** Overview of Pavement Management Systems (PMS) : Components, Systems methodology, Levels and functions, use of PMS as a research planning and technology improvement tool, data requirements and applications Introduction to Pavement Recycling: Principles of Reclaimed Asphalt Pavements, available recycling techniques, data collection processes, data analysis, mix design, field applications, QC/QA issues, life cycle cost analysis, testing procedures, and constructability issues Introduction to Pavement Preservation Program (P3): Principles of P3, available P3 techniques, data collection processes, data analysis, mix designs (if needed), field applications, QC/QA issues, life cycle cost analysis, testing procedures, and constructability issues. Case Studies: Construction, maintenance, rehabilitation, reconstruction strategies and data needed to make the right decisions; tools and techniques currently available for implementing a pavement preservation technique

#### **Text Books**

- Ralph Haas and Ronald W. Hudson with Lynne Cowe Falls, ' Pavement Asset Management', Scrivener Publishing, Wiley, 2015.
- Prithvi Singh Kandhal, ' Bituminous Road Construction in India', PHI Learning Pvt. Ltd., 2016.
- The Asphalt Handbook; MS-4 (7th Edition); The Asphalt Institute, ISBN: 9781934154274, 2007.
- James G. Speight, Asphalt Materials Science and Technology, 1st Edition, Elsevier, ISBN: 978-0-12-800273-5, 2015.

#### **Reference Books**

- Ralph Haas and Ronald W. Hudson and John Zaniewski, ' Modern Pavement Management', Kreiger Publishing Company, 1994.

- Relevant publications/codes from Federal Highway Administration, IRC, AASHTO, Transportation Research Board, National Institute of Standards and Technology and US Army Corps of Engineers.

**Prerequisite:**