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**Monday, February 26, 2018**  
**3:30 - 4:30pm**  
**CAVC 459**

**The Role of Dynamics in Enhancing  
the Mechanistic Approach to Pavement Engineering**

**Abstract:** The performance of pavements is affected by vehicle loading characteristics, including the magnitude and duration of the load, and axle-tire configurations; and these are in turn affected by dynamic vehicle-pavement interactions. While the importance of pavement loading in predicting pavement response and performance is widely accepted by the pavement engineering community, relatively little attention has been given to the complexities of dynamic vehicle-pavement interactions, and their role in enhancing the mechanistic approach to pavement design and management. Early contributions from pioneers in this field have not received enough attention from the pavement community at large to enable the inclusion of dynamics in mechanistic pavement design and management. In this presentation, the role of pavement dynamics and vehicle-pavement interaction in enhancing the mechanistic approach to pavement engineering will be discussed, including applications to pavement analysis and design, preservation and life cycle assessment, and interpretation of non-destructive tests. Finally, the potential for using innovative continuous structural health monitoring in the context of next generation, multi-functional pavements is introduced.

**Bio:** Dr. Karim Chatti is a Professor of Civil Engineering at MSU and the Director of the University Transportation Center on Highway Pavement Preservation. Prior to that, he was the Director of the Michigan DOT Pavement Research Center of Excellence. He also served as acting Associate Dean for Research in the College of Engineering in 2013-2014, CE Graduate Program Director in 2012 and CEE Associate Chairperson for Graduate Studies and Research from 2005 to 2009. He holds B.S. (1985) and M.S. (1987) degrees from MSU, and a Ph.D. degree from the University of California at Berkeley (1992). He worked as an assistant research engineer at the Institute of Transportation Studies at UC-Berkeley prior to joining MSU in 1993 as a visiting assistant professor. He was a consultant overseas (1996-97) before rejoining MSU as a tenure-track faculty member in 1998.

Dr. Chatti is an internationally recognized expert in pavement engineering. His research focuses on mechanistic modeling of pavement systems, including pavement dynamics, dynamic vehicle-pavement interaction, dynamic backcalculation of pavement layer properties from FWD tests, surface roughness characterization, pavement preservation, long-term pavement performance, and pavement continuous health monitoring. He has been involved in approximately forty research projects, totaling about \$13 Million, funded by the Michigan and California Departments of Transportation (MDOT and CalTrans), the Federal Highway Administration (FHWA), the National Cooperative Highway Research Program (NCHRP), the second Strategic Highway Research Program (SHRP2), and the US Department of Transportation (USDOT). He has advised more than thirty graduate students including twelve Ph.D.'s. He has also directed several postdoctoral fellows and has mentored many undergraduate student researchers. He has authored/co-authored more than 150 peer-reviewed publications and 30 technical reports.

Dr. Chatti is an associate editor of the ASCE journal of Transportation Engineering – Part B pavements, and past associate editor for the ASCE Journal of Transportation Engineering; he is also on the editorial board of the International Journal of Pavement Engineering. He is past chair of the ASCE highway pavements committee, and a member of several other ASCE and Transportation Research Board committees. He is also a board member of the International Forum for Road Transport Technology.