Invited Seminars/ Courses:

34. **R. Ramachandran.** The basics of flowsheet modeling in pharmaceutical manufacturing. *AAPS Annual meeting and exposition*, Denver, CO, 2016.
33. **R. Ramachandran.** Modeling wet granulation: Challenges in discrete element methods and population balance models. *AAPS Annual meeting and exposition*, Orlando, FL, 2015.
32. **R. Ramachandran.** Process control, integration and mechanistic modeling of particulate processes. Brewer Science, Rolla, MO, 2015. (1 day course)
31. **R. Ramachandran.** Predictive modeling of wet granulation processes in catalyst manufacturing. Evonik, Marl, Germany, 2015.
30. **R. Ramachandran.** Multi-scale model development and validation of wet granulation processes: toward QbD in pharmaceutical manufacturing. *Novartis*, Basel, Switzerland, 2015.
29. **R. Ramachandran.** Multi-scale model development and validation of wet granulation processes. BASF, Ludwigshafen, Germany, 2015.
28. **R. Ramachandran.** Advanced process control and sensor integration on continuous pharmaceutical manufacturing processes. Dept of Chemical Engineering, University of Tokyo, Tokyo, Japan, 2015.
27. **R. Ramachandran.** Integration of PAT, process modeling and control in the continuous manufacture of pharmaceutical tablets, 13th New Pharmaceutical Technology and Engineering (NPTE) Conference, Tokyo, Japan, 2015.
26. **R. Ramachandran.** Flowsheet modeling and control of continuous pharmaceutical manufacturing processes. Janssen supply chain (JSC) leadership meeting, Newark, NJ, 2015.
25. **R. Ramachandran.** Mechanistic modeling of mixer-granulator processes: toward QbD in pharmaceutical manufacturing. NIPTE research conference: Pharmaceutical critical path manufacturing-2015, Rockville, MD, 2015.
24. **R. Ramachandran.** Integration of sensors, process modeling, and control in the continuous manufacture of pharmaceutical tablets and strip films: toward QbD and PAT. Brewer Science, Rolla, MO, 2015.
23. **R.Ramachandran.** Modeling, control and optimization of continuous direct compaction pharmaceutical manufacturing processes. IFPAC SUMMIT 2015 Conference, San Juan, PR, USA, 2015.
22. **R. Ramachandran**. Control systems in continuous manufacturing. Bristol Myers Squibb (BMS) day event, New Brunswick, NJ, USA, 2015.
21. **R. Ramachandran**. Multi-scale model development and validation of wet granulation processes. Bristol Myers Squibb (BMS) day event, New Brunswick, NJ, USA, 2014.
20. **R. Ramachandran.** A novel continuous pharmaceutical tablet manufacturing process integrated with inline PAT tools and an automated control system. Annual International Society of Pharmaceutical Engineering (ISPE), Las Vegas, NV, USA, 2014.
19. **R. Ramachandran**. Multi-scale model development and validation of wet granulation processes. City College of New York (CCNY), New York, NY, USA, 2014.

18. **R. Ramachandran**. Multi-scale model development and validation of wet granulation processes. Bristol Myers Squibb (BMS) day event, New Brunswick, NJ, USA, 2014.
17. **R.Ramachandran**. Modeling, control and optimization of continuous direct compaction pharmaceutical manufacturing processes. IFPAC SUMMIT 2013 Conference, San Juan, PR, USA, 2013.
16. **R. Ramachandran.** Introductions and application of advanced process control in Pharmaceutical processes. Bristol Myers Squibb, New Brunswick, USA, 2013. (1 day course)
15. **R. Ramachandran.** Multi-scale modeling of particulate processes. Leeds University, Leeds, UK, 2013.
14. **R. Ramachandran**. Flexible multipurpose continuous processing of a pharmaceutical tablet manufacturing process. Advanced Process Modeling Forum, London, UK, 2013.
13. **R. Ramachandran.** Agglomeration modelling of wet granulation processes. Western Michigan University, Kalamazoo, MI, USA, 2013.
12. **R. Ramachandran**. Modeling and control of particulate processes. Purdue University, West Lafayette, USA, 2013.
11. **R. Ramachandran**. Towards QbD in continuous pharmaceutical manufacturing: Modeling and control strategies. Werum user meeting, Luneburg, Germany, 2012.
10. R. Ramachandran. Dynamic flowsheet simulation of continuous pharmaceutical manufacturing processes. Advanced Process Modeling Forum, London, UK, 2012.
9. **R. Ramachandran**. Modeling and experimental validation of spray drying processes. Unilever, Bedford, UK, 2012.
8. **R. Ramachandran**. Population balance modeling of biological systems. New York Academy of Sciences, New York, USA, 2012
7. **R. Ramachandran.** Aggregation modeling in wet granulation processes. P&G, Newcastle, UK, 2011.
6. **R. Ramachandran.** Modeling and control of downstream pharmaceutical processes. NJAIChE, Scotch Plains, NJ, USA, 2011.
5. **R. Ramachandran.** Aggregation modeling in wet granulation processes. P&G, Cincinnati, OH, USA, 2011.
4. **R. Ramachandran.** Modeling and control of downstream pharmaceutical processes. Merck, West Point, PA, USA, 2010.
3. **R. Ramachandran.** Modeling and control of downstream pharmaceutical processes. Association of Consulting Chemists & Chemical Engineers, Inc, Scotch Plains, NJ, USA, 2010
2. **R. Ramachandran.** Modeling and control of downstream pharmaceutical processes. Bristol Myers Squibb, New Brunswick, USA, 2010.
1. **R. Ramachandran**. Introduction to MATLAB and its application to Engineering Problems. Institute of Electrical and Electronic Engineers Singapore Chapter, National University of Singapore, Singapore, 2005