

RESEARCH EXPERIENCES FOR TEACHERS – SUMMER 2019
Enhancing Teacher Knowledge & Skills in Modern Manufacturing
RET Project #4: Surface Engineering

- 1) Focus: a 3-day experience on fundamentals of surface engineering, surface characterizations and related approaches for data analysis
- 2) Lab training and integrated project: 1) achieve fine finished surfaces for metallic material samples, 2) obtain hands-on experience on operating precision device for surface quality characterizations, 3) understand basic approach for evaluating surface quality/integrity, 4) and have basic understanding of the quality engineering and statistical process control tools.
- 3) Authentic research experience: Participants will gain knowledge of the surface engineering, interchangeability, quality engineering and hands-on experience of operating surface measurement equipment.
- 4) Equipment: Surface profiler, Interference microscopic profiler, Hardness test machine (indenter) and other machines (optional) for advanced surface analysis and characterizations
- 5) Expected outcomes:
 - Understand basic concepts related to surface engineering
 - Understand knowledge and experience in analytic approaches for analysis of surface integrity and statistical process control
 - Experienced with metrology and surface characterization/imaging equipment

Date	Topic	By	Lab
Day 1	Lecture 1: Learning profilometry on contact and non-contact profilometer	Zimo Wang	ETB 3006
	Lecture2: Estimation of surface finish, bearing area curve		
Day 2	Lab session: Measuring surface morphology using profilometer	Zimo Wang	ETB 3006
	Lecture 3: Mechanical property of finished surface (with hands-on experience on mechanical property tests)		TBD
Day 3	Advanced analytic approaches for surface characterization	Zimo Wang	TBD
	Group discussion on “Implementation and challenges”		