Microwave Engineering Syllabus March 1, 2013

1. Microwave Engineering, EEL 4436C, 3 credits

2. Prerequisites: EEE 3300 Electronics 1, EEL 3470 Electromagnetic Fields and Waves

3. Course logistics: Classroom-based, TBD

4. Dr. Jonathan Bagby

EE 518

Hours TBD

561.297.3462

[bagby@fau.edu](mailto:bagby@fau.edu)

5. TA information: NA

6. Course description: Review of electromagnetics, transmission lines, waveguides, microwave network analysis, impedance matching and tuning, microwave resonators, microwave power dividers, couplers and filters, microwave oscillators and mixers, CAD design techniques.

7. Course objectives/student learning outcomes: To provide students with a firm foundation in microwave engineering and design techniques. Design considerations include transmission lines and waveguides, network analysis, impedance matching and tuning, microwave resonators, power dividers, couplers, filters, oscillators and mixers, and use of CAD software packages.

8. Course evaluation method:

Homework assignments 20%

Computer design projects 20%

Semester tests (2) 20% each

Final exam 20%

9. Course grading scale:

85 – 100% A

75 – 84% B

65 – 74% C

55 – 64% D

<55% F

Note: “+” and “–“ grades are awarded in these ranges.

10. Policy on makeup tests, late work, and incompletes: *Late assignments* will be accepted for a reasonable period with appropriate penalty. *Makeup tests* are given only if there is solid evidence of a medical or otherwise serious emergency that prevented the student of participating in the exam. Makeup tests should be administered and proctored by department personnel unless there are other pre-approved arrangements. *Accommodation* will be made for university-approved activities and religious observances. *Incomplete grades* are against the policy of the department. Unless there is solid evidence of medical or otherwise serious emergency situation incomplete grades will not be given.

11. Special course requirements: NA

12. Classroom etiquette policy: University policy requires that in order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular phones and laptops, are to be disabled in class sessions.

13. Disability policy statement: In compliance with the Americans with Disabilities Act (ADA), students who require special accommodations due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) located in Boca Raton campus, SU 133 (561) 297-3880 and follow all OSD procedures.

14. Code of academic irregularity policy: Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and place high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. See University Regulation 4.001 at

[www.fau.edu/regulations/chapter4/4.001\_Code\_of\_Academic\_Integrity.pdf](http://www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf)

15. Required textbook: *Microwave Engineering,* 4th ed., D. M. Pozar, Wiley, 2012

16. Supplementary material: *Microwave Engineering Class-Notes*, Rev. ’11, J. Bagby, available on Blackboard

17. Course topical outline

LectureTopics Approximate # of Lectures

1. Introduction to microwave engineering 1

2. EM plane waves 2

3. Conventional transmission lines 2

4. Parallel plate waveguide 2

5. Rectangular waveguide 2

6. Circular waveguide 2

7. Coaxial waveguide 2

8. Dielectric slab waveguide 2

9. Metallic strip waveguides 1

10. Wave velocities and dispersion 1

11. Microwave network modal analysis 2

12. Excitation of waveguides 1

13. Impedance matching and tuning 1

14. Theory of small reflections 1

15. Multisection transformers 1

16. Transmission line resonators 1

17. Cavity resonators 2

18. Cavity perturbations 2

19. Tests and reviews 2

Exam Dates (tentative)

Exam 1: Sep. 20; Exam 2: Oct. 23; Final Exam: Nov. 29