King Fahd University of Petroleum and Minerals

Electrical Engineering Department

EE 420

Fiber Optics Communication

Laboratory Manual

July 2005

PREFACE

This manual contains ten laboratory experiments to be performed by students taking the optical fiber communication course (EE 420). The various experiments included in this manual are designed to enrich the student experience in the field of fiber optics communication and to compliment and improve understanding of the various concepts studied in the classroom lectures. The experiments range from introductory ones in which the student learns basic concepts such as optical power measurement to more advanced experiments, such as experiments that utilize the optical time domain reflectometer (OTDR) in fiber optics measurements.

The experiments are designed, whenever possible, to be theoretically verifiable. This is important not only for gaining practical experience, but also to give students confidence in the theory studied in the classroom lecture. In addition, in the design of those experiments, lengthy and repetitive procedures are avoided, whenever possible. Repetitive measurements are only done when such measurements are essential for theoretical interpretation and verification of the experimental results. A lot of effort has been made to simplify and clarify the experimental procedure and to insure smooth conduct of the experimental measurements.

The students are strongly encouraged to read the introductory part of each experiment ahead of time, before attending the laboratory. Each experiment contains an ample and clear introduction to the experiment, which should facilitate understanding, conducting and interpretation of the experimental work.

Students at the senior level are expected to submit professionally-written laboratory reports. To help the student prepare professional quality reports, a guide has been developed and included in Appendix A along with a sample report. The EE 420 students are strongly encouraged to read this guide and the sample report, because they stress and clarify a number of basic ideas that are frequently neglected or misunderstood by our students. Because a number of EE 420 laboratory experiments utilize laser sources, a laboratory safety procedure has been included at the end of this manual.

I would like to thank Mr. Hameed Frazi, Mr. Joey Espinosa and Mr. Ibrahim Al-Rashid of the EE department for providing invaluable help during the hardware setup of the various experiments found in this manual.

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July, 2005

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