

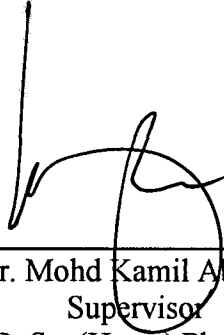
**DESIGN FABRICATE AND DETERMINATION OF THE  
CHARACTERISTIC OPTICAL FIBER LENS**

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**Final Year Project Report Submitted in  
Partial Fulfillment of the Requirements for the  
Degree of Bachelor of Science (Hons.) Physic  
in the Faculty of Applied Sciences,  
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This Final Year Project Report entitled “**Design, Fabricate and Determination of The Characteristic Optical Fiber Lens**” was submitted by Mohd Hazwan Bin Abdul Rahman, in partial fulfillment of the requirements for the Degree of Bachelor of Science (Hons.) Physics, in the Faculty of Applied Sciences, and was approved by

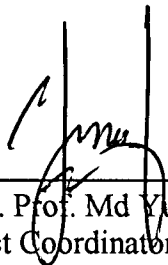


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## ABSTRACT

The efficient coupling between fiber to laser diode or fiber to fiber has been a problem in general of general concern since the advent of fiber-optic communication system. Fiber lenses are regularly used in fiber coupling. Fiber lenses are also particularly attractive in optical fiber communication, as they make the design of more compact optical components and modules possible. But the efficiency of the lens needs to be improved since the large working distance and the large beam waist have been concerns as a problem. The fiber lenses were made by using an optical fusion splicer Type-36 by melting the tip of the fiber. The variables of the lens fabrication to create the variable of beam output are ball lens, tapered ball lens, hemispherical, tapered hemispherical, conical and tapered conical. So to evaluate the performance of the fiber lens, one needs to measure its characteristics, including the location of the focal point, the working distance and the beam waist. The properties of the designed fiber lenses can be simulated in ZEMAX to see the characteristics of the fiber lens. As a project, the tapered conical lens has the smallest working distance and compatible beam waist for coupling.