

The Statement of Purpose

Taking a proper decision at turning point of life is very important for a man. After my higher secondary certificate examination, I got an opportunity to observe a fuel extraction station at Maguchara, Sylhet after a stern blowout occurred in June 15, 1997. The severe blowout damaged the adjacent areas, rail lines, caused death of several lives, polluted the environment and most importantly ruined the station for future use. I was shocked and ashamed of the negligence and ignorance that caused the disaster. I strongly felt that my country needs some top quality engineers, basically in the field of Mechanical Engineering and I decided to pursue this as a career.

I, S. M. Mahbub Murshed have completed my bachelor in Mechanical Engineering from Bangladesh University of Engineering & Technology (BUET)¹. My undergraduate study at BUET was a great experience. I came to know how to analyze the bodies under load assuming them as rigid, what to consider if it is assumed elastic and then how to combine all these theories for designing machine elements. I learnt that designing machine element is not akin to applying some theories and equations to get some values only; it's a sophisticated decision-making process. I discovered that "engineering is the art of applying the physical sciences to the problems of mankind" (*Design of Machine Elements*, V. M. Faires).

When I started exploring the theories of fluid mechanics, the subject matters started to spellbind me. Deciphering the problems of *Fluid Mechanics* by F. M. White was one of my favorite things to do. Our course tutor, one of the pioneers in Computational Fluid Dynamics Prof. Sadrul Islam is my inspiration for the study of fluid dynamics. His assignments during course work gave ample opportunities to learn solving fluid problems with the use of computers.

During the second term of first year I got the opportunity to test my computer programming skill in a contest titled "*Intra-BUET Computer Programming Contest 1999*"², junior section. We, the only team from Mechanical Engineering Department stood fourth keeping behind other mature teams. I received a lot of focus and recognition from several national dailies, monthlies and related web sites³ for it. Later on, I felt very proud to find one of the programming problems formulated and solved by me to be included in a book named "Programming Challenges - The Programming Contest Training Manual" by Steven S. Skiena, Miguel A. Revilla.. In course of time I learnt various computer programming languages including C/C++, Java, Visual Basic, C# and various other computer applications, for example Linux Networking, Microsoft Office Packages, AutoCAD etc. I had also written several technical articles in some standard national magazines.

I learnt an important lesson from my dissatisfactory result due to late examination schedule at first level first term: never let a silhouette to fall over your goal. Later during my coursework, I passed through several situations similar to this one, but the lesson helped me to remain focused and obtain satisfactory grade.

I have researched on "*Effect of Pressure Angle in the Gear Teeth: A Finite Difference Approach*" as my undergraduate thesis under the supervision of Dr. M. A. Salam Akanda. A journal paper on this computational solid mechanics related engineering analysis is to be published later. I must agree that my way of thinking and analyzing was enhanced during the research period with Dr. Akanda. I had learnt dissecting problem, finding solution, and organizing ideas for taking a decision.

During the undergraduate study I had worked as a trainee engineer in the 'Haripur Power Station', a 100 MW power station consists of three open cycle gas turbine units. In that time a Hot Gas Path Inspection (HGPI) of a power generating unit was being carried out, which gave me the golden opportunity to watch the heavily engineered components of a 33 MW gas turbine generator. I was once again allured by the magnificence of Mechanical Engineering.

I was introduced with Mechatronics systems during a course on "Measurement and Instrumentation". I had developed a wind velocity measurement system as a course

requirement and got engrossed with the development of such systems. A paper on the system was published in “*BSME-ASME International Conference Dec. 2001, Dhaka*”. I chose “Mechatronics” as an optional subject at final year to learn more of it. I have designed and developed a data acquisition system with stepper motors: controlling 3-dimensional probe positioning and registering data from a five-hole yaw meter for each position. The whole system can work independently through the customized computer windows software that I had developed. The system is in use by an M. Sc. student in the turbulence laboratory of Mech. Eng. Dept. BUET under the supervision of Prof. Taher Ali.

After I had finished my undergraduate studies I had promptly chosen to study Mechatronics further as my M. Sc. major. A developing country like Bangladesh has many prospects in Mechatronics application. Many industries presently use Mechatronics system installed by some foreign industries. But no local experts are available. Power plants, garment industries, food processing industries, chemical industries, household appliances, miscellaneous product design etc. are some prospective fields of application of Mechatronics system in our country. I think my choice of study in this subject will enable me to serve my country to meet the challenge of new era.

I found that US Universities are most advanced in the field of my interest while I browsed through university web sites. Especially I was charmed by the verities of research carried out at the Mechanical and Aerospace Eng. Dept. of Arizona State University. I liked the well equipped department with more than thirty laboratories, research activities divided in four well organized groups. The research activities on ‘*Intelligent Control of Mechanical Systems*’ attracted me most among others. I hope that the admission committee will consider me as a potential research assistant in related field.

After I had passed my bachelor degree I got several job opportunities, and worked in a software company for one month. Currently, besides doing my M. Sc. in Mech. Eng., BUET I am working as a Teaching Assistant under Prof. Taher Ali. I intend to apply for Teaching Assistantship in ASU and I hope that my experiences are worth noting in this respect.

I was involved in different cultural activities in BUET. I hope that I would be able to make a significant contribution to the multifarious cultural environment of university campus. Presently, I am a member of Bangladesh Society of Mechanical Engineers (BSME), Bangladesh Linux User Group (BDLUG⁵), Bengali Computing Group (Ankur⁶).

Though ASU is a very competitive school, I hope that I will be considered as a competent student. I believe that I can work hard, can work alone as well as in group and have a great desire to learn thoroughly. I wish to dedicate myself in my study and research, if I am given an opportunity in ASU. Moreover, I wish that the admission committee should consider me for any kind of scholarship available in the Arizona State University. I look upon your university as a platform to develop my skills so that I can achieve my goal to be a successful engineer.

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