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The Design, Construction, Implementation, and Integration of a New Petroleum Engineering Campus in the Middle East

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Abstract

This paper concerns the planning, construction, implementation, and integration of new state-of-the-art teaching laboratories for Petroleum Engineering at Texas A&M University at Qatar, a new international campus in the Middle East.

The results are seven laboratories designed to teach and support seven topics covered under the university curriculum for Petroleum Engineering at Texas A&M University. The laboratories were designed and built for the new campus in Doha, Qatar, to instruct the student in team programs and cover the following topics:

1. Geology (both general and advance reservoir characterization)
2. Core Petrophysics
3. Fluid and Gas PVT Properties
4. Drilling Systems
5. Production (to include fluid measurement in up to three phases)
6. Well Control (to include construction and implementation of a drilling rig floor for simulation)
7. 3-D Simulation Room for Reservoir Characterization

Introduction

Since the first student was enrolled in Petroleum Engineering at the University of Pittsburg in 1910 many changes have occurred both to the number of schools teaching, the number of graduates and the curriculum taught (Agbaraji et. al., 2002). Before the Second World War the emphasis was on how to engineer the solution and after the war the emphasis was on why (Earlougher and Penn, 1962; Kimball, 1964). The “why,” defined as the science and physics behind the solution to the problem, and the “how” being the methods used to gain the

result required. One possible reason for the shift was that a large number of the students after the war had extensive experience gained either through serving in the Armed Forces or by actual work in the field.

Along this change in petroleum engineering education came reductions in the number of hours required to graduate (Nielsen, 1968). In 1979 the Curriculum for Petroleum Engineering at Texas A&M University required 145 hours and generally took a minimum of 5 years. Now the curriculum is 132 hours (Texas A&M University Undergraduate Catalog, 2007). This reduction was implemented to facilitate the graduation of the students in a four year schedule.

With the shift in teaching methodology and hours required, another issue became critical to this engineering field. This issue is student enrollment. Initially the majority of students who enrolled in this field came from areas that were involved with the industry. In the United States this included Texas, California, Oklahoma, Louisiana, Kansas, Pennsylvania and other states neighboring producing fields. If you look at the number of schools offering Petroleum Engineering in **Table 1** you will see that in the U.S. the majority of schools are in these regions. However, several factors have influenced this source of students:

1. Industry reputation in the area of the environment. (Aggour, 2005).
2. Viability of the engineering field for future development; the common comment in the news since the 1970’s is that we will be out of oil in 5-20 years.
3. The downturn of the industry in the 1980’s and the reduction of production and operations in the U.S.; as a result, the local source of students has been greatly reduced.
4. Increase in technical fields other than engineering such as Information Technology (IT).
5. The last is harder to define in that with the downturn in the industry in the mid-80’s many of the potential students that would be available have been directed by their parents and family to look in another direction.

To meet the needs of the industry or “the great crew change” more engineers will be required; at the current graduation rates