

Brazilian Views on:

- Accreditation of Biomedical Engineering Programmes,
- Training of Clinical Engineers and the
- IFMBE International Register of Clinical Engineers

Saide Jorge Calil
Centro de Engenharia Biomédica
Departamento de Engenharia Biomédica
Faculdade de Engenharia Elétrica e de Computação
Universidade Estadual de Campinas - UNICAMP

General View on Biomedical Engineering in Brazil



- There are 22 Biomedical Engineering groups
 - 5 private Institutions
 - 17 public Institutions

- From the 21 groups,
 - only 4 recognized post graduating Programmes specifically on Biomedical Engineering (by the Ministry of Culture and Education)
 - The remaining are mixed with other Post Graduating Programmes

- Up to year 2002, Biomedical Engineers - post graduation level (MSc and PhD)

- Today there are 2 universities with under graduation courses

Training of Clinical Engineers

- Model developed in 1992, basically for Electrical Engineers

- Teaching highly concentrated on basic subjects such as:
 - Biomedical Instrumentation
 - Maintenance Management
 - Electronic revision

- **(Instrumentation and management - 66%)**

Training of Clinical Engineers

- There are 4 courses on Clinical Engineering (specialization level)
- Candidate Profile: electronic, civil and mechanic engineers; architects; "tecnólogos")
- Implemented in 1992, so far there are today about 550 certified specialists on Clinical Engineering
- Clinical Engineering in Brazil is not a profession but a specialization

Training of Clinical Engineers

(Changes on the last 10 years)

■ HEALTH

- Setting up ANVISA (a Brazilian version of FDA)
- Need of registration to trade in Brazil
- Need of certification according to standards
- Hospital Accreditation Program (voluntary)

■ INDUSTRY

- Need of certified and registered equipments
- Good Manufacturing Practice

■ GOVERNMENT

- Projects following strict rules for management and operation is the condition to International (financial) support

Training of Clinical Engineers

(Method to restructure the course)

- Organization of a workshop inviting segments working with the health sector
 - Health Units
 - Manufacturers and dealers
 - Maintenance services (external)
 - Government
 - Educational units (involved with Clinical Engineering)
 - Associations (SBEB e ABCECLIN)*

* SBEB – Brazilian Society of Biomedical Engineering
ABCECLIN – Brazilian Association of Clinical Engineering

Training of Clinical Engineers (Results)



- Methodology for Certification and registration of medical equipments
- How to write reports
- financial management
- Operation of Test simulators
- Contract analysis
- Electronic (basic)
- Metrology
- Risk management
- Acquisition process

Training of Clinical Engineers (Results)

- Technology assessment
- Technology Management
- Human Resources Management
- Quality programmes methodologies
- Training methodologies
- Safety programmes
- Statistics
- Training on Technical solutions (projects management)
- Medical Instrumentation concepts
 - Instrumentation and management 75%

International Register of Clinical Engineers



- Established in Brazil in 1995, there are about 15 Clinical Engineers with international certification of the ACCE
- There is a movement from ABECLIN to set up a Brazilian Certification for Clinical Engineers

Conclusion

- Establish a consensus among the 4 clinical engineering courses and the ones to be opened
- Became a professional rather than a specialist
- Set up a certification method to assess the knowledge of the specialists working in the Clinical Engineering area



Thank you for your patience

Saide Jorge Calil

calil@ceb.unicamp.br

