

INTRODUCTION TO MEDICAL EQUIPMENT PLANNING

medical architecture planning systems

hospital planners & medical technology consultants

Introduction to

Medical Equipment Planning

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medical architecture planning systems
P.O Box 910313 Amman • Jordan

Telephone: 00 962 6 4646 365

Fax: 00 962 6 4646 364

Email: maps@maps-jo.com

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A training course by
maps
medical architecture planning systems

Course outline

Role of Biomedical Engineers as Medical Planners

1 Biomedical engineers are involved in new hospital projects during both the design and construction phases. During design they are responsible for determining the quantities, types, sizes and capacities of all medical equipment required for the project. They will also provide the project's architect and electromechanical engineers with all the technical data and drawings required to prepare the electromechanical design, such as equipment dimensions, weights, power consumption, heat loss, water and drainage connections, etc. As a planner, the new role of the biomedical engineer involves selecting equipment, specifying them, and coordinating them with the hospital building. That's why it's essential for the medical planner to understand how the hospital is organized as a building, and to be familiar with its different units and departments.

The new role of the Biomedical Engineer involves dealing with medical equipment as an integral part of the hospital, and not as stand alone device.

Morphology & Design of Modern Hospitals

2 The medical planner is responsible for the selection and coordination of medical equipment within a hospital project. One shall know how his or her workplace is organized, and thus knowledge and understanding of how hospitals are planned & designed as buildings is considered essential for the biomedical engineer involved in equipment planning. In this part of the course

The Biomedical Engineer must have a good knowledge and understanding of where medical equipment are: "the hospital". In sales and service careers, it's a plus. In planning, a must.


















the zones and departments comprising the hospital are introduced and their functional relationships to each other are examined. The impact of the building design on the choices of medical equipment and systems are also illustrated with hospital drawings examples. Sketches and layouts of different regional and international hospitals will illustrate the basic concepts of hospital planning and design and how all that relate to the planning of the project's medical equipment.

Electromechanical Requirements of Medical Equipment & Systems

3 One of the key roles of biomedical planners in a hospital under design and construction is to supply other engineers of all the service technical requirements necessary for the proper installation and functioning of the planned equipment. The biomedical engineer, after making his selections of the equipment, in both type and quantity, will use standard forms or templates, often computerized, to list these requirements. Often the biomedical engineer needs to make his own calculations

The Biomedical Planner is responsible to determine and calculate all required services including power rating and consumption, water and drain connections, heat dissipation, exhaust connections, medical gases, etc.

| Legend of Electromechanical Symbols | |
|---|--|
|  | Patient to Nurse Push Call Button |
|  | Patient to Nurse Pull Cord |
|  | Staff to Staff Push Call Button |
|  | Code Blue Alarm Push Call Button |
|  | Telephone Outlet |
|  | Double Socket Outlet, 13 Amp, Switched with Indicator Lamp |
|  | Single Socket Outlet, 13 Amp, Switched with Indicator Lamp |
|  | Socket Outlet, Low Voltage |
|  | Single Socket Outlet, 13 Amp, UPS |
|  | Single Socket Outlet, X-RAY Machine |
|  | Double Socket Outlet, 13 Amp, UPS |
|  | Medical Vacuum Outlet |
|  | Compressed Air Outlet, 4 Bar |
|  | Compressed Air Outlet, 7 Bar |
|  | Oxygen Outlet |

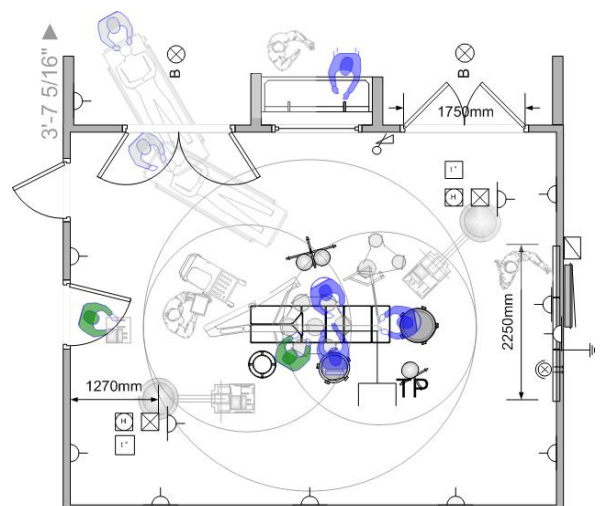
Sizing the Required Quantity & Capacity of the Project's Medical Equipment

4 Every hospital project requires different quantities and capacities of medical equipment based on the number of beds, clinics and the workload volume of the hospital in general. The biomedical planner will determine these requirements which will affect the areas assigned to each department. Examples are determining the number and size of steam sterilizers, the number and throughput of chemistry and hematology analyzers in the laboratory, etc. The planner will use computer based calculation formulas to determine the size and quantity after entering the parameters of the project.

Over-sizing cost unnecessary expenses, both capital and running. Under-sizing leads to operational problems and deficiencies. It is the Biomedical Planner who should arrive through calculations, at the Right-Size of the equipment such as CSSD sterilizers, chemistry & hematology analyzers, radiology machines, E.C.G, etc.

Preparing the Project's Medical Equipment Drawings

5 In this section of the course, students will learn and practice on how to lay out the required equipment onto hospital project's drawings using planning softwares. The drawings will include equipment icons, electromechanical outlets and ergonomic data. Equipment Schedules and Bills of Quantity will be generated from the drawings.



Preparing the Project's Medical Equipment Specification Documents

6 Students will learn the criteria for writing technical specifications, preparing Room Schedules & Equipment Schedules of medical equipment and systems in a systematic and scientific way and according to international codes and standards. They will also practice on technical specification writing, coordinating the specifications with the project's medical equipment drawings, and reviewing tender submittals. Technical Specifications, Room & Equipment Schedules, and Medical Equipment Drawings, all comprise part of the Tender Documents of any Hospital Project.