CORE CONCEPT

Laboratory Planning and Design Course: Lab Layouts, Containment, Fume Hoods and Utilities

30 August – 10 September 2027
Barcelona - Eixample district four-star

Laboratory Planning and Design Course: Lab Layouts, Containment, Fume Hoods and Utilities

Ref: 1979_29313 **Date:** 30 August – 10 September 2027 **Location:** Barcelona - Eixample district four-star **Fees:** 42300 SAR

Introduction:

Laboratory planning and design, covering lab layouts, containment, fume hoods and utilities, is a 2-week course for laboratory owners, capital project managers and design consultants that ends with a Laboratory Design Brief and Planning Package for a case organisation. New research and clinical laboratories often open with benches that cannot take new equipment, hoods placed where exhaust cannot reach and containment suites that need costly rework. Nominees already sponsor, manage or design laboratory projects, and the course is taught through case studies on space programmes, drawings and hood schedules. CoreConcept Training Center delivers this laboratory planning and design course.

Course Objectives:

- Translate scientific methods, headcount and equipment lists into a laboratory space programme and owner requirements document
- Lay out research and clinical laboratories on a planning module grid, choosing between open and closed arrangements and placing support rooms
- Define containment zoning for each suite using biosafety level features such as separated entry, directional inward airflow and sealed surfaces
- Select fume hood types and plan once-through exhaust, stack discharge and hood diversity with energy use in view
- Specify laboratory utilities, specialty gas distribution, service carriers and flexible casework that allow later change
- Plan design reviews, commissioning tests and handover records, then assemble a Laboratory Design Brief and Planning Package

Target Audience:

- Laboratory owners and directors accountable for scientific capacity in new or renovated facilities
- Capital project managers responsible for laboratory budgets, design stages and contractor handover
- Design consultants responsible for laboratory architecture, layouts and engineering services coordination
- Facilities and estates managers responsible for laboratory exhaust, utilities and future adaptation
- Laboratory operations managers responsible for equipment planning, user briefs and phased relocations

Course Outline:

Day 1: Laboratory Typologies, Project Stages and Owner Requirements

- Research, Clinical, Teaching and Testing Laboratory Typologies Compared
- Wet Laboratory and Dry Laboratory Space Characteristics
- Laboratory Project Stages From Feasibility to Occupancy
- Owner Project Requirements Document for Laboratory Buildings
- Existing Laboratory Space Utilisation and Condition Survey

Day 2: Space Programming, Planning Modules and Containment Frameworks

- Laboratory Space Programme Built From Headcount and Methods
- Laboratory Planning Module Grid and Bench Aisle Dimensions
- Biosafety Levels One to Four Facility Feature Matrix
- Chemical Hazard Zoning of Floors and Laboratory Suites
- EN 14175 and ASHRAE 110 Hood Test Methods Compared

Day 3: Layout Design for Research and Clinical Laboratories

- Open Laboratory Versus Closed Laboratory Layout Trade-Offs
- Laboratory Support Rooms and Equipment Corridor Placement
- Write-Up Desk Zones Separated From Bench Areas
- Clinical Laboratory Sample Reception to Analyser Flow Layout
- Adjacency Diagram Linking Laboratory Suites and Shared Cores

Day 4: Fume Hood Selection, Exhaust Strategy and Laboratory Utilities

- Ducted and Ductless Fume Hood Selection Criteria
- Constant Volume, Bypass and Variable Air Volume Hoods Compared
- Once-Through Laboratory Air and Exhaust Stack Discharge Placement
- Laboratory Vacuum, Compressed Air and Purified Water Loads
- Specialty Gas Cylinder Rooms, Manifolds and Piped Distribution

Day 5: Week-One Case Study on a Research Laboratory Floor

- Case Research Floor Space Programme and Module Grid Test
- Case Fume Hood Schedule and Exhaust Volume Estimate
- Case Utility Matrix per Bench and Equipment Position
- Case Open Versus Closed Layout Option Appraisal
- Concept Layout Review Against Owner Project Requirements

Day 6: Containment Suites, Service Distribution and Flexible Casework

- BSL-3 Suite Entry Sequence With Two Self-Closing Doors
- Directional Inward Airflow and Filtered Exhaust Design Intent
- Sealed Surfaces, Windows and Penetrations in Containment Suites
- Service Spine and Overhead Service Carrier Distribution Options
- Mobile Casework, Adjustable Benches and Plug-In Equipment Zones

Day 7: Design Risk, Hood Performance Criteria and Quality Review

- Laboratory Design Risk Register With Hazard and Cost Lines
- ANSI/ASSP Z9.5 Airflow Monitor and Sash Alarm Provisions
- Auxiliary Air Hood Avoidance and Make-Up Air Decisions
- Exhaust Re-Entrainment Review Against Building Air Intakes
- Design Stage Quality Review Checklist for Laboratory Drawings

Day 8: User Groups, Briefing Decisions and Renovation Change Control

- Scientist User Group Briefing Sessions and Requirement Sign-Off
- Equipment List and Room Data Sheet Validation With Users
- Phased Renovation Decant Plan for Operating Laboratories
- Design Change Request Log for Laboratory Projects
- Sash Closing and Hood Use Briefing for New Occupants

Day 9: Energy Benchmarking, Commissioning and Handover Performance

- Laboratory Energy Intensity Benchmarking Against Office Buildings
- Fume Hood Diversity Factor and Exhaust Fan Sizing
- Hood Hibernation, Occupancy Sensors and Night Setback Options
- Commissioning Plan With Functional Tests for Hoods and Utilities
- Handover Records, User Training and Post-Occupancy Evaluation

Day 10: Capstone Case Study for the Laboratory Design Brief and Planning Package

- Capstone Space Programme and Module Grid for Own Organisation
- Capstone Containment Zoning and Fume Hood Schedule
- Capstone Utilities, Specialty Gases and Casework Plan
- Capstone Commissioning, Handover and Energy Targets Schedule
- Laboratory Design Brief and Planning Package Completion and Presentation

Skills You Will Gain:

- Laboratory Space Programming
- Planning Module Layout
- Containment Suite Zoning
- Fume Hood Specification
- Laboratory Exhaust Strategy
- Specialty Gas Distribution Planning
- Laboratory Commissioning Planning
- User Requirement Briefing

Why Attend This Course:

- Present a Laboratory Design Brief and Planning Package to the project sponsor, the design team lead and the laboratory director for approval
- Decide which laboratory layout, containment zoning and hood types a design must adopt before drawings are fixed
- Avoid rework of containment suites, undersized exhaust, missing gas outlets and benches that cannot take new equipment
- Equip project colleagues with space programme templates, hood schedules, utility matrices and commissioning checklists used in the case studies

Conclusion:

Back at work, the participant gives the Laboratory Design Brief and Planning Package to the project sponsor, the laboratory director and the lead design consultant. The sponsor uses it to release the design commission, while the director confirms space, containment and equipment needs for each suite and the consultant uses the hood schedule and utility matrix to start engineering design. After the first design stage review, the project team should compare drawings with the package, record deviations and revisit hood diversity and utility loads where scientific plans have changed.

Frequently Asked Questions FAQ:

What should participants know before a laboratory planning and design course?

Participants should already sponsor, manage or design laboratory projects and read architectural drawings. Bringing an equipment list, a current floor plan or a draft brief for a planned laboratory helps them apply the case studies to their own project.

How does laboratory planning and design differ from a laboratory safety management course?

It concentrates on the building: space programmes, layouts, containment zoning, fume hood selection, exhaust, utilities, casework and commissioning before occupancy. Laboratory safety courses cover daily operation, chemical handling, inspections and emergency response in laboratories that already exist.

Why do fume hoods drive laboratory planning and design decisions on lab layouts and utilities?

Fume hoods exhaust large volumes of conditioned air once through, so their number, type and position set exhaust fan size, make-up air, energy use and where benches and services can sit. Hood decisions are therefore made early in planning.

What do participants take back from the laboratory planning and design course?

Participants take back a Laboratory Design Brief and Planning Package for a case organisation, with a space programme, module grid layout, containment zoning plan, fume hood schedule, utility and gas matrix, and a commissioning and handover schedule.