



# HIGHER EDUCATION FACILITY DESIGN

Designing spaces that enable life-enhancing  
instruction and life-changing learning

**BSA**

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**Innovative educational and research programs require equally innovative classrooms and laboratories.**

Martin C. Jischke  
Former Purdue University President



# A LifeStructure improves lives.

BSA LifeStructures designs facilities that support, enhance and inspire healing, learning and discovery. Facilities that are LifeStructures.

Our multidisciplinary efforts with visionary healthcare, higher education and research clients achieve measurable outcomes through metrics-driven design solutions. Together, we create inspired solutions that improve lives.

## Learning

A building designed for learning shouldn't simply house educational programs. It should inspire, facilitate and drive learning by supporting the vision of faculty, the ambitions of students and the discoveries of researchers.

With BSA LifeStructures, you get a firm that specializes in developing spaces that enable life-enhancing instruction and life-changing innovation. As a result, you get facilities that attract and encourage today's best students, teachers and researchers while anticipating the needs of tomorrow's academic community. And you get all of this in facilities that merge progressive design with academic tradition to complement and enhance the total campus environment.

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## BY THE NUMBERS

# 5.0M+

square feet of research and academic space designed since 1975

# 82%

of the firm's higher education work is STEM or medical education and research-related

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# Classroom to lab and back again.

Science, technology, engineering and math (STEM) learning environments are changing.

Today's higher education environment places more emphasis on team-based and experiential learning. As a result of this evolution, classrooms are becoming learning laboratories.

Learning labs are flexible spaces that have the ability to serve multiple academic functions and be reconfigured to meet changing needs. BSA LifeStructures creates multi-use areas where students and faculty can flow from lecture and classroom instruction into experiments and team work, all within one space.

## Researching how students learn

Purdue University's Hall for Discovery Learning Research Center (DLRC) is working to revolutionize learning in the STEM disciplines. All DLRC learning and teaching areas are essentially research spaces. Flexible design allows researchers to reconfigure rooms into learning pods of various sizes that incorporate technology and adjustable seating arrangements that support breakout sessions. These rooms also have the ability to alter acoustical attributes and lighting.

DLRC provides creative learning, science, and project laboratories where experts in academia, industry and K-12 education collaborate. Projects here explore novel technologies and pedagogies designed to enhance learning at all levels.



ABOVE | Purdue University - Hall for Discovery and Learning Research



## Flexibility in the laboratory

The design for Purdue University's Jischke Hall of Biomedical Engineering was created hand-in-hand with the new program's curriculum. Its spaces, including the projects lab shown here, are designed to be adapted to project-based and team-based work.

### **BENCH**

mobile furniture and technology minimizes efforts to adapt physical environments to the evolving nature of science

### **UTILITIES**

overhead utilities and power sources allow users to easily reconfigure to meet unique research and project requirements



## Engineering on display.

The most innovative feature inside the University of Notre Dame's newest engineering and research facility is something that is missing altogether – traditional classrooms.



It is designed to encourage observation, discussion and collaboration. The learning center allows students to collaborate in spaces with movable technology to fit their project needs. Other students and visitors can observe this collaboration via glass partitions invigorating the mind and inviting a sense of excitement about the field of engineering.

Visitors can also see nano-fabrication taking place in the clean room and the engineering systems that support the high performance clean room environment.



The building itself is designed as an extension of the curriculum. Real time electrical power metering is displayed as a “dashboard” on flat screen monitors for students and visitors to observe.

# STINSON-REMICK HALL



9,000 square foot research and academic space  
**+ CLEAN ROOM**

Balancing the academic and spiritual mission  
**+ CHAPEL**


**+ LEARNING CENTER**  
Benches and tables for instructional and team-work

- Learning Center
- Clean Room
- Research



STINSON-REMICK HALL

2009



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# How can facility design instill curiosity and energize undergraduate students in their pursuit of careers in science and research?

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“ The building was designed to place our very best researchers in close proximity and highly visible and apparent to our undergraduates.

Peter Kilpatrick  
McCloskey Dean of Engineering  
University of Notre Dame



## VIEWS

connection with the outside and with peers help to energize the users of the space

## FLEXIBILITY

the learning environment should be designed for both individuals and groups to successfully use the space

## SURFACE

the highly kinetic style of hands-on learning requires the design to consider the purpose and function of every surface



## **SOCIAL**

students want to transition from collaboration to conversation without the need to physically leave a space

# Focus, socialize, & collaborate

Learning behavior has adapted into three distinct actions, or zones.

The three behaviors are identified as focus, socialize and collaborate. The challenge is blending the three zones into one effective learning environment.

Active learning environments help students feel equally at home while studying individually, socializing with classmates and collaborating on group projects.

### **BY THE NUMBERS**

# 70%

of students say they prefer to learn in a group rather than in solitude

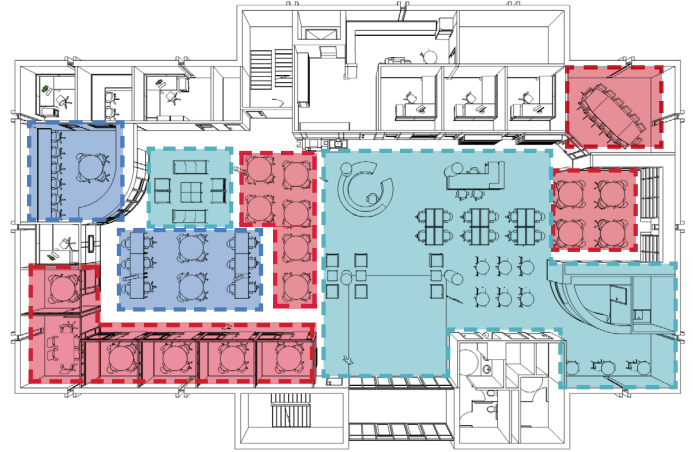
# 51%

of students categorize themselves as hands-on learners

# In the zone

The learning environment must be comprised of spaces that fulfill dedicated functions while also supporting the entire floor plan and program. Zones allow us to create a design that celebrates these relationships between different spaces.

Adjacencies are critical to proper creation of learning zones, where students can seamlessly transition from one setting to another. Technology and furnishings reinforce the architectural design intent of active learning spaces and allow communication and ideas to move with the users.



## Focus Zone



### DEFINITION

space for activities that requires a high level of concentration to accomplish a task

### ACTIVITIES

studying, researching, writing, concentrating, reflecting, analyzing, problem-solving, imagining

### ENVIRONMENT

can include individual desk space, lounge areas and isolated rooms

## Social Zone



### DEFINITION

space for engagement outside of programmed space for scheduled and impromptu conversation

### ACTIVITIES

connecting, interacting, talking, laughing, networking, celebrating, bonding

### ENVIRONMENT

can include lounges, cafés, lobbies, nooks, galleries and media stations

## Collaboration Zone



### DEFINITION

space to work in group settings to achieve a common goal, an extension of the classroom

### ACTIVITIES

discussing, listening, presenting, brainstorming, creating, sharing

### ENVIRONMENT

can include team workspaces, media spaces, a cluster of seating and breakout rooms

# Preparing medical students for the workplace

When hiring medical, nursing or other allied health professional students, employers are looking for graduates with strong critical thinking skills, flexibility and an ability to work and communicate as a team.

BSA LifeStructures creates learning environments that reflect the team-based approach to wellness that is found in today's hospitals, clinics and medical centers. This interprofessional learning experience better prepares students for their future.

## INTERPROFESSIONAL

Interprofessional education is the active engagement of students from various healthcare disciplines to improve academic collaboration and the quality of care.



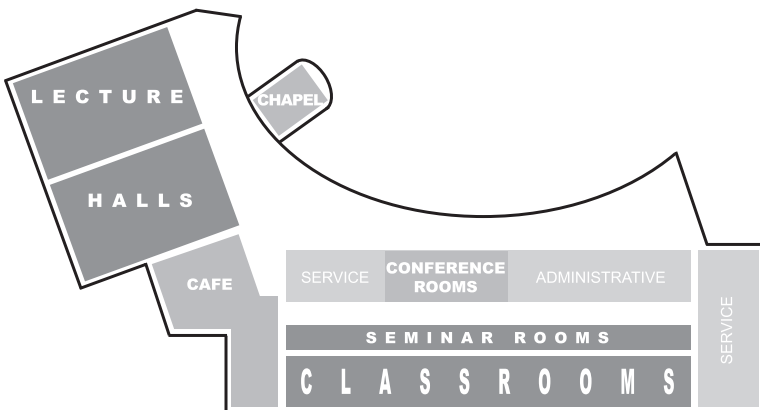
# Creating a home for a new college of osteopathic medicine at Marian University.



The Michael A Evans Center for Health Sciences is home to a new College of Osteopathic Medicine and Marian University's School of Nursing. It can accommodate 600 students, with half on campus in classes while the other half are in rotations.

The building is designed to enable interprofessional training. Skills labs and simulation rooms provide hands-on training experiences. An abundance of seminar and study rooms encourage small group problem-solving.

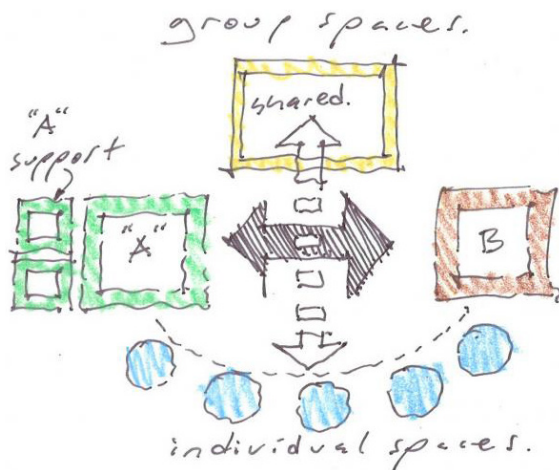
Nursing classrooms and medical seminar rooms are located immediately adjacent to each other throughout the building, creating opportunities for interaction among nurses and doctors and for side-by-side training.



ABOVE | first floor diagrammatic plan



# Team-based clinical education at Purdue University's Health and Human Sciences Building.



The layout of the Health and Human Sciences Building fosters collaboration through shared space, while still offering each of the three academic departments its own identity. The result is a design that links research and clinical disciplines together.

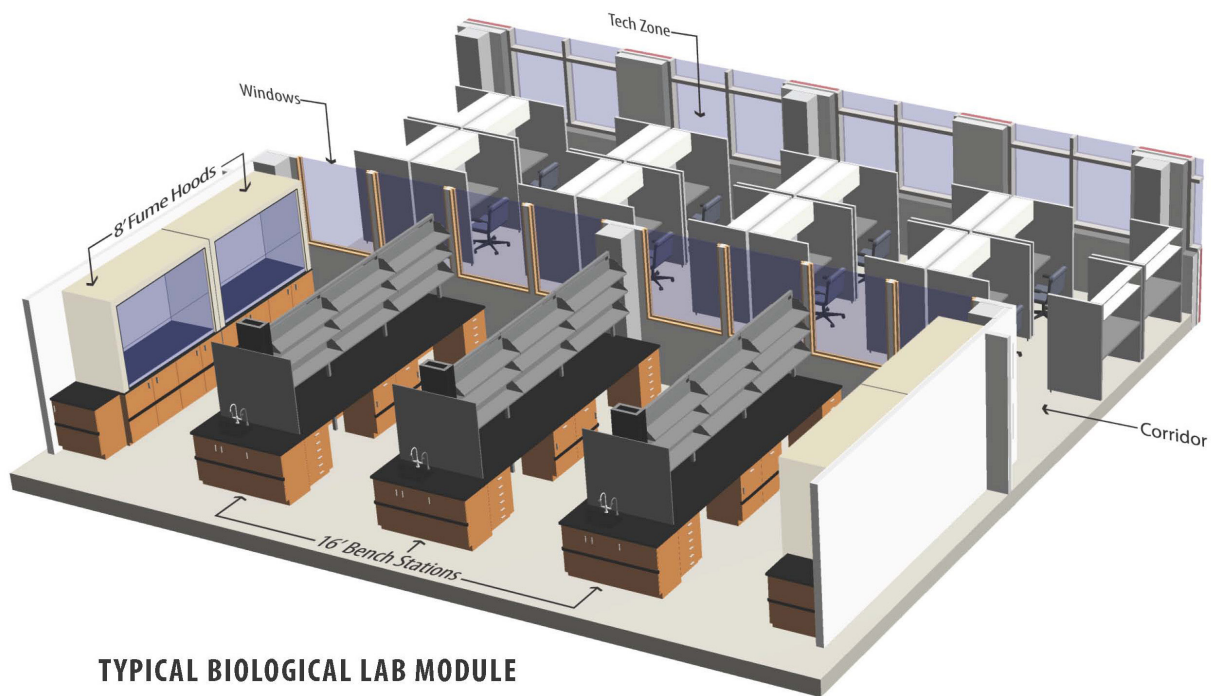
The Health and Human Sciences Building at Purdue University brings together two universities, three academic departments and six medical clinics in one interdisciplinary facility.

The combination of academic, research and clinic space encourages interprofessional collaboration and reflects current healthcare practices with a team-based approach to wellness. Its design was based on the neighborhood concept with each neighborhood having its own entries, boundaries, streets and central meeting place. This created a clear identity and easy access to each department and clinic within the building.

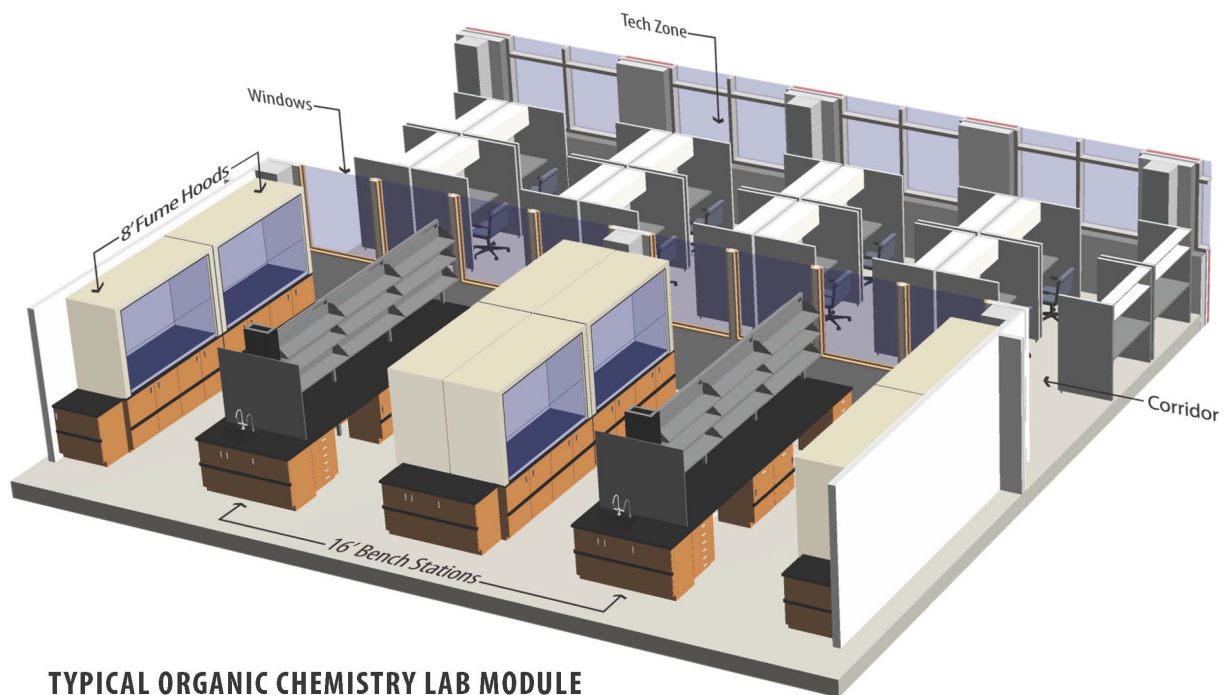
Acting as a connection to the historic campus, the new building reflects Purdue's traditional architecture.

TOP | conceptual diagram for user movement  
MIDDLE | first floor diagrammatic plan





**TYPICAL BIOLOGICAL LAB MODULE**



**TYPICAL ORGANIC CHEMISTRY LAB MODULE**

# What will my research lab look like?

Laboratory requirements, and therefore laboratory design, vary by research program, by client preference and standards, and sometimes by researcher. The answer is more about what your lab is able to do than what it looks like.

Our laboratory design process begins with a modular approach with zoning, casework and utility solutions to maximize a facility's ability to respond to changing conditions over time.

## **PROVIDE ADAPTABLE CONFIGURATIONS**

Fixed benches, suspended systems, mobile carts... all of one system, or a combination of all? Design must consider how and how often equipment, processes and teams may change.

## **SUPPORT THE WORK, WHEREVER IT IS**

Researchers no longer spend their entire day in their labs. Today's technology allows them to set up tests and processes in their labs and to analyze the results remotely in their offices, in a break room or in a collaboration area.

## **ADJUST TO TECHNOLOGY**

Technology is never standing still, especially in industries that specialize in discovery. Flexible space layouts allow researchers to adapt to the size requirement of new equipment more easily, without major renovations and without disruption to their daily research activities.





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**HELPING STUDENTS  
EXPLORE AND NAVIGATE,  
CONNECT AND DISCOVER.**

ARCHITECTURE  
ENGINEERING  
PLANNING  
INTERIORS

# BSA

BSA LifeStructures, a national, interdisciplinary design firm, creates inspired solutions that improve lives. BSA provides architecture, engineering, interior design, and planning services for spaces that support and enhance healing, learning and discovery – facilities known as LifeStructures.

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