



AIA Westchester
Hudson Valley

MT. ST. MICHAEL ACADEMY ARCHITECTURE CLUB
2016 – 2017 Program

SESSION 1 SUMMARY: PROGRAM INTRODUCTION

Session date: September 27, 2016

Teachers: Ray lead, Heike, Sara, Jane

Presentation:

- Welcome and introductions
- Who we are (volunteer Architects from AIA Westchester Hudson Valley)
- Students introduce themselves and say why they are interested in Architecture
- Discuss the Yonkers program we ran from 2009 – 2014
- Discuss ideas about what we have in mind for this Architecture Club (see power point for details)
- Students discuss any other ideas they have for the club
- Show images of significant structures from history they should recognize (pyramids, Greek temples, gothic cathedrals, etc...)
- Show examples of exciting contemporary architecture they may not know
- Idea is to get them excited about Architecture, the profession of Architecture and the Architecture Club

Activity / project: none for this intro session



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SESSION 2 SUMMARY: INTRODUCTION TO PLANS, SECTIONS AND ELEVATIONS

Session date: October 4, 2016

Teachers: Jane lead, John, Ray

Presentation:

- Hand out sketch books
- Fundamentals of plans, sections and elevations
- Examples of plans, sections and elevations in 5 projects designed by Jane's office

Activity / project:

- Cut up fruit and vegetables
- Discuss the differences in the plans sections and elevations
- Some have the same plan and section (an orange)
- Others have very different plans and sections (a pineapple)
- Use other objects to show plan / section differences (bolts, screws, cups, etc...)
- Students sketch the plans, sections and elevations of all this in their sketchbooks
- If there's time they can present their sketches to the class

Homework:

- Sketch the plan of their bedroom at home in their sketch book



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SESSION 3 SUMMARY: MEASUREMENT AND DRAWING PLANS TO SCALE

Session date: October 11, 2016

Teachers: Ray lead

Presentation:

- Discussion of the plan and ceiling plan of their classroom (walls, windows, doors, light fixtures, soffits, etc...)
- Examples of simple and complex floor plans
- Examples of sketched plan diagrams (Le Corbusier and Louis Kahn)
- Show plans and see if the students can identify the buildings from the plans
 - o Stonehenge
 - o Pyramid
 - o Greek temple
 - o Gothic cathedral
 - o US Capitol
 - o Empire State Building
 - o Frank Gehry Disney Concert Hall
- Show how you measure an existing space
 - o Overall room dimensions first
 - o Then door and window locations
- Discuss creating a scaled plan based on the measurements

Activity / project:

- Students break into two groups and go measure another room in the school
- Reassemble and each group works at drawing the plan of that room to scale
- Materials needed: Large pads of paper, pencils and pens, architectural scales, tape measures (laser measure if available)
- Students present their scaled plans



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SESSION 4 SUMMARY: NATURE OF MASONRY ARCHITECTURE

Session date: October 18, 2016

Teachers: John lead, Heike, Ray

Presentation:

- Use of masonry in buildings from early civilizations through the modern era
- Types of masonry and masonry assemblies
- Examples of masonry architecture in early civilizations
- Principles of post and lintel structural systems
- Introduction of masonry arches to span greater distances
- The innovation of gothic cathedrals
- Masonry use in the modern era (cladding on a steel or concrete frame rather than load bearing)

Activity / project:

- Students cut wedge shaped objects out of paper and determine how many are needed to make a half circle arch (if the angles are all 15%, then 6 pieces are needed)
- 12 wood blocks have been pre-cut (each a trapezoid with 15 degree angles)
- The students break down into two groups and each assemble one arch
- Then they place minimal loading on the arch (which collapses)
- They then reassemble the arches and use books to restrain the bottom edges
- Now the arches can take considerable loading before collapsing
- Hint – need 15 degree wood wedges to create a flat top on the arch to place loading (ie books)
- Students compete to see which arch can take the most weight
- Students can then use the wood blocks to create other structures



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SESSION 5 SUMMARY: NATURE OF STEEL ARCHITECTURE

Session date: October 25, 2016

Teachers: Heike lead, Sara, Ray

Presentation:

- Overview of steel structures
- What is steel made of and how is it made?
- Girders, beams and columns
- Differences between masonry and steel structures
- 19th century developments using steel in buildings
- Examples of contemporary steel structures
- Steel space frames, trusses and geodesic domes (as lead in to the activity)

Activity / project:

- Materials needed: small stale marshmallows, toothpicks
- Students use marshmallows and toothpicks to create steel-like truss or space frame structures
- Bridge or tower structures are both possible
- Students work in groups or individually
- See who can make the most stable structure, the longest spanning structure or the tallest structure



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SESSION 6 SUMMARY: FIELD TRIP

Session date: November 1, 2016

Teachers: Richard Dattner lead, Ray, Sara, Heike

Presentation:

- Field trip to the Bronx Central Library, Dattner Architects
- The building, completed about 6 years ago, has won many AIA Design Excellence Awards and was the first LEED Certified (Silver) public facility in NYC
- Richard Dattner, founding partner of the internationally renowned firm of Dattner Architects, spoke with the students about the Vitruvian principles of Architecture – firmness, commodity and delight; then about the team of architects and consultants needed to create a building like the Library.

Activity / project:

- Tour of the Library.



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SESSION 7 SUMMARY: INTRODUCTION TO MODEL MAKING

Session date: November 8, 2016

Teachers: Ray lead

Presentation:

- The tools of model making
- Use of models as a basis for construction in ancient architecture (instead of drawings)
- Abstract versus realistic models
- Models as a design tool and / or for presentation
- Examples of models and the finished buildings they represent
- The future of model making – 3D printing?

Activity / project:

- Materials needed: templates printed on heavy paper, scissors, scotch tape, pencils, scales or rulers
- Students use the printed templates to cut out forms that can be folded and taped together to create simple models (5 different templates provided)
- Once they are comfortable with using the templates, they can start to draw their own templates on blank paper and design their own models
- Students work in groups or individually
- If there's time, the students can present to the class what they have designed and built



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SESSION 8 SUMMARY: INTRODUCTION TO SketchUp 3D MODELING

Session date: November 15, 2016

Teachers: Rob lead, Ray

Presentation:

- Instruction in the use of SketchUp software
- Drawing lines, polygons, etc.. and extrusions into 3D objects
- How to create sloped roofs, openings, windows, trim, etc...
- How to draw with precise dimensions
- Use of materials (brick, siding, etc...)

Activity / project:

- Prior to the class, SetchUp was loaded onto all the computers in the school's computer lab (SketchUp is free)
- Students work at their computers trying to replicate what's shown in the presentation
- Students are given the plans and elevations of a building to model themselves (Louis Kahn's Trenton Bath House)
- Tool to import SketchUp models of existing buildings is discussed
- Buildings such as St. Patrick's Cathedral, the Empire State Building, the Statue of Liberty and Freedom Tower are all imported and discussed in terms of detail and scale
- Students are encouraged to get SketchUp on their home computers and continue experimenting



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SESSION 9 SUMMARY: LIGHT IN ARCHITECTURE

Session date: November 29, 2016

Teachers: Heike lead, Rob, Ray

Presentation:

- Light as a definer of Architecture
- Natural light, aesthetic and health benefits
- Sources of daylight in buildings – windows, skylights, oculus, clerestory windows
- Design characteristics and types of windows
- Use of natural light to create mood
- Solar orientation and its impact on architecture
- Natural light and design inspiration (Le Corbusier's light shelves, Ronchamp, etc..)
- Artificial light's impact on Architecture
- Light fixtures

Activity / project:

- Students move to the computer lab to do a project in SketchUp
- Show examples of LeCorbusier sunscreen elements on various projects
- Students model a simple block then add a multi-story sunscreen to it
- After they do this they can try other versions of their own design



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SESSION 10 SUMMARY: FIELD HOUSE DESIGN

Session date: December 6, 2016

Teachers: Ray lead

Presentation:

- An introduction to the design of school Field Houses (which will be the class design studio project starting in January)
- Show examples of various Field House plans (review functions, adjacencies and 3D characteristics)
- Show examples of various Field House images including long span roofing systems
- Final example of a Field House with a round dome-like roof structure (Manley Field House at Syracuse University)
- Show steel geodesic dome structures which lead into the project

Activity / project:

- Chicago Architecture Foundation “Build a Dome” project
- Students roll up newspaper sheets into “logs” then tape them together to form triangles which are used to create a geodesic dome structure



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SESSION 11 SUMMARY: Sketching Plans by hand

Session date: December 20, 2016

Teachers: Ray lead

Presentation:

- Review of material previously presented
 - o Conceptual plan sketches (Le Corbusier and Kahn)
 - o Detailed and accurate floor plans
 - o Identifying well know buildings from their plans

Activity / project:

- Hand sketching plans, emphasis on looking carefully at relationships, proportions, etc...
 - o Greek temple
 - o Gothic Cathedral
 - o Empire State Building



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SESSION 12 SUMMARY: How is a building designed?

Session date: January 3, 2017

Teachers: Ray lead, John

Presentation:

- An overview of how buildings are designed and the process Architects go through
- Getting hired
 - o How clients find out about you
 - o Recommendations, website, marketing, etc...
- What you need before starting work
 - o A contract with the client
 - o Review of what's in a typical contract
 - o Scope of work, fee, timeframe, phases, consultants, etc...
- Phases of your work
 - o Programming
 - o Schematic Design
 - o Design Development
 - o Construction Documents
 - o Bidding
 - o Construction Administration
 - o Discussion about what the Architect does in each phase

Activity / project:

- Hand out a sample Architect / Owner Agreement for review and discussion
- Show sample schematic drawings and construction drawings and further discuss what happens in these phases of work



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SESSION 13 SUMMARY: Programming

Session date: January 10, 2017

Teachers: Ray lead, Heike

Presentation / Activity:

- The first step in the studio design project that will be the main curriculum for the rest of this year's Architecture Club is programming
- The students were given the responsibility of developing a program for a new Field House Building to meet the needs of Mount St. Michael's Athletic Department (budget is not a limitation for this project)
- The students interviewed MSMA Director of Athletics Mario Valentini who had the following input
 - o An indoor field for teams to use for practice in bad weather is needed (football, soccer, lacrosse, track and field)
 - With an artificial turf surface
 - If possible, a regulation size football field will yield maximum flexibility of use
 - A 60 yard field could work if regulation size is not possible
 - Placement of the running track at a level above the field was discussed
 - o Other sports needing space
 - Wrestling – both practice and meets
 - Bowling (alleys)
 - Golf (with simulator or nets)
 - Tennis (could go outside of the Field House building)
 - Swimming and diving
 - o Other functions
 - Exercise and weight room
 - Physical therapy room
 - Locker rooms
 - Storage
 - Team video rooms (seating 40 to 50 for football)
 - 10 to 12 offices for coaching staff (one office per sport)
 - Hospitality room for recruiters
 - o Connections
 - Bridge or tunnel connections to the school are desirable if possible

- The students interviewed MSMA President Peter Corritori who had the following input
 - o A Field House's main need is to benefit students and the school's programs
 - o Immediate needs include:
 - Fitness center
 - Pool
 - Squash courts
 - Fencing facility
 - Wrestling
 - Golf simulator
 - Additional basketball courts
 - o President Corritori encouraged the students to think expansively and consider whether re-orienting the current football field would allow for improvements to that as well as a better site for the Field House



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SESSION 14 SUMMARY: Site Selection for Field House Project

Session date: January 17, 2017

Teachers: Ray lead

Presentation / Activity:

- This session focused on selecting a site on the Mount St. Michael campus for the Field House design project
- The program developed last week was reviewed and the major program components were sketched to the scale of a campus site plan
- The students concluded that incorporating a full size regulation football field, inside a proposed Field House, was not possible given the site constraints
- A half size field looks to be possible and the option of multiple levels was discussed
- The students did a walking tour of the campus and concluded that only one site in the SW corner of the campus was feasible



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SESSION 15 SUMMARY: Site Plan Concept Development

Session date: January 24, 2017

Teachers: Ray lead

Presentation / Activity:

- The students began an analysis of the site selected for the Field House project
 - o Size in relation to program elements
 - o Adjacencies to other buildings on campus
 - o Possible alignments with other buildings on campus

- Program elements were sketched to the scale of the site plan and the students began to study plan layout concepts

- The possibilities of multiple levels in relation to the sloping site was discussed



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SESSION 16 SUMMARY: Architectural Sections

Session date: January 31, 2017

Teachers: Ray lead, Heike

Presentation:

- Presentation about architectural sections
- Example of the Pantheon (in plan, elevation and section)
- Review of the typical elements cut through in a section (floors, walls windows) and visible in the distance
- Example of a theater (can be fairly simple in plan and complex in section)
- Examples of notable architecture (show image or plan then section)
 - o Guggenheim Museum (Wright)
 - o Ronchamp (Corbu)
 - o Ford Foundation Building (Roche Dinkeloo)
 - o Exeter Library (Kahn)
 - o Glass House (Johnson)
- Examples of sections through sloping landscape

Activity:

- Construction of a section through the site of the Field House project
 - o Discuss how to draw this at a defined scale
 - o Interpretation of info on a contour drawing
 - o Students then draw site sections



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SESSION 17 SUMMARY: Field Trip to Architect's Office

Session date: February 7, 2017

Teachers: Ray lead, entire GBds office

Activity:

- A brief introduction and tour of the office
- Students go around desk to desk talking with partners and staff about what they do on a day to day basis as an Architect
- Get together at the end for a group discussion and Q&A



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SESSION 18 SUMMARY: Field Trip to Architecture School

Session date: January 31, 2017

Teachers: Ray and Jim

Activity:

- Tour of the City University School of Architecture by Michael Miller, Director of Operations



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SESSION 19 SUMMARY: Field House, Main Level Plan Development
Session date: February 28, 2017

Teachers: Ray lead, Jane

Presentation:

- Review of decisions made to date on the Field House studio project
 - o Site selection
 - o Programming
- Review of the program for the main level of the Field House
 - o Turf field
 - o Main entry from campus (with vehicular drop-off)
 - o Lobby
 - o Fire stairs
 - o Elevator
 - o Bathrooms
 - o Hospitality room for recruiters
- Review of the program for a possible mezzanine level
 - o Running track
 - o Seating for spectators
 - o Fire stairs and elevator
 - o Storage

Activity:

- Students work on plan layouts (to scale) incorporating the above program



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SESSION 20 SUMMARY: Field House, Lower Level Plan Development
Session date: March 7, 2017

Teachers: Ray lead, Heike

Presentation:

- Review of decisions made to date on the Field House studio project
 - o Site selection
 - o Programming
 - o Main Level plan development
- Review of the program for the lower level of the Field House
 - o Wrestling room
 - o Bowling alleys
 - o Golf simulator
 - o Exercise and weight room
 - o Physical therapy room
 - o Locker rooms
 - o Fencing room
 - o Squash courts
 - o Storage
 - o Possible tennis courts (outside)
 - o Team video room
 - o 10 to 12 offices for coaching staff

Activity:

- Students work on plan layouts (to scale) incorporating the above program



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SESSION 21 SUMMARY: Field House, Lower Level Plan Development

Session date: March 21, 2017

Teachers: Ray lead

Presentation:

- Review of decisions made to date on the Field House studio project
 - o Site selection
 - o Programming
 - o Main Level plan development
- Review of the program for the lower level of the Field House
 - o Wrestling room
 - o Bowling alleys
 - o Golf simulator
 - o Exercise and weight room
 - o Physical therapy room
 - o Locker rooms
 - o Fencing room
 - o Squash courts
 - o Storage
 - o Possible tennis courts (outside)
 - o Team video room
 - o 10 to 12 offices for coaching staff

Activity:

- Students continue to work on the plan of the lower level, begin discussion of making a study model of the field house design (to begin next week)



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SESSION 22 SUMMARY: Field House - work on a study model

Session date: March 28, 2017

Teachers: Ray lead

Presentation:

- Review of model making techniques and procedures
 - o Safety procedures for cutting
 - o Working to scale
 - o How to measure and cut pieces for the model
 - o Glue techniques
- Discussion of differences between study and presentation models (we'll be building a study model)

Activity:

- Ray has done prep work precutting pieces of the lower level for the students to assemble
- Students start to measure and cut pieces to add to the model
- Most of the lower level is completed in this session



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SESSION 23 SUMMARY: Field House - work on a study model and verbal presentations

Session date: April 4, 2017

Teachers: Ray lead

Presentation:

- Review (again) of model making techniques and procedures
 - o Safety procedures for cutting
 - o Working to scale
 - o How to measure and cut pieces for the model
 - o Glue techniques
- Review of work done on lower level last week and discussion of work on the main level and mezzanine this week
- Students make a verbal presentation to Director of Athletics Mario Valentini (who they interviewed during the development of the program) and School President Peter Corritori
 - o Students present reasoning behind the site selection, plan layout concepts and adjacencies
 - o The Director of Athletics is pleased with the outcome and has some input on designing the locker rooms as smaller in size and greater in number (instead of one big locker room)

Activity:

- Ray has done prep work precutting pieces of the main and mezzanine levels for the students to assemble
- Students also measure and cut pieces to add to the model
- Most of the main and mezzanine levels are completed in this session



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SESSION 24 SUMMARY: Field House - work on site contour model

Session date: April 11, 2017

Teachers: Ray lead

Presentation:

- Review (again) of model making techniques and procedures
 - o Safety procedures for cutting
 - o Working to scale
 - o How to measure and cut pieces for the model
 - o Glue techniques
- Review of work done so far on the study model of the building
- Discussion of how to build site models with contours showing grading

Activity:

- Ray has done prep work precutting contour layers for the students to finish cutting out and assembling
- The entire site contour model is assembled in this session



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SESSION 25 SUMMARY: Field House - work on model's roof trusses

Session date: April 25, 2017

Teachers: Ray lead

Presentation:

- Review (again) of model making techniques and procedures
 - o Safety procedures for cutting
 - o Working to scale
 - o How to measure and cut pieces for the model
 - o Glue techniques

- Review of work done so far on the study model of the building
- Discussion of the design of the field house trusses which span 180'
- Input from a structural engineer including the depth of the trusses (about 9') and the configuration of the web members to place them in tension as required to span this distance

Activity:

- Ray has done prep work precutting 14 trusses for assembly by the students
- Other aspects of the study model are completed in this session



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SESSION 26 SUMMARY: Photovoltaic technology

Session date: May 2, 2017

Teachers: Barrett Silver (Silver Lining Solar) lead, Ray

Presentation:

- Barret did a power point presentation about the way electrical energy is typically produced and how solar and other renewable energy sources are transforming that industry
- Discussion of the photovoltaic installation taking place the school and how the existing roof configuration and orientation impacted the panel layout

Activity:

- Barret took the group to the roof to see the installation in progress
- Group discussion about how photovoltaics could be incorporated in the field house studio project



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SESSION 27 and 28 SUMMARY: Field House exterior design
Session dates: May 9 and 16, 2017

Teachers: Ray lead

Activity:

- Wireframe elevations and 3D base drawings of the Field House's massing were prepared before the session

- Students work on the design of the building's exterior:
 - o Materials (brick, glass and metal panels)
 - o Size and definition of windows and doors
 - o Other exterior features
 - o Colors are used to represent materials