West Essex Regional School District
Board of Education Meeting

April 24, 2023

Music Composition

(Advisor: Marion Drew)

"A Dreamer in a Mirror"

by Logan Bogumil

TSA Computer-Aided Design (CAD), 2D Architecture

Jonah Ng - Architecture Independent Study
Advisor: Tim Shea

New Jersey Institute of Technology - Intro to Arch
Summer 2019

UMass Amherst University - Arch100
Summer 2021


A


B


C


G


D


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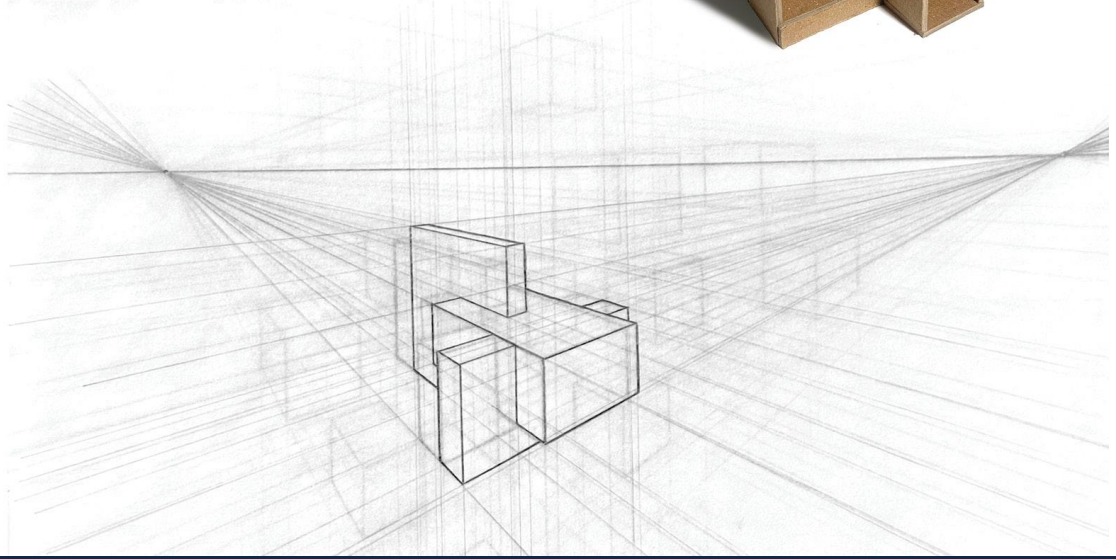
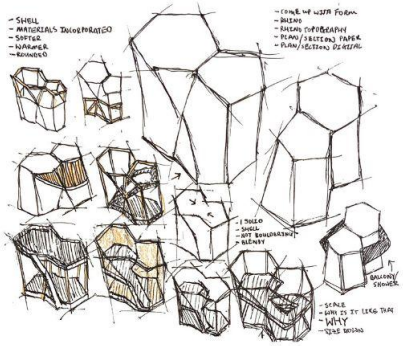
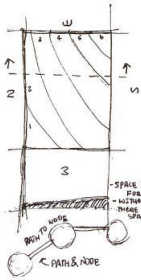
H




- SHELL
- MATERIALS INCORPORATED
- SOFTER
- HARDER
- ROUNDED
- COVER OF WIRE FORM
- BRICKS
- RATTAN CHAIR BACK
- PLAN/SECTION/ PAPER
- PLAN/SECTION/ METAL
- SHELL
- SHELL
- SOFT BOUNDARIES?
- RATTAN?
- SEAT
- LOW IS IT LESS THAN
- WHY
- GLASS WINDOW
BALCONY SHOWER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2
3
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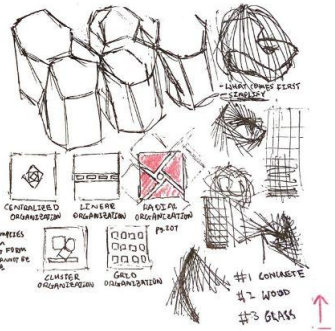
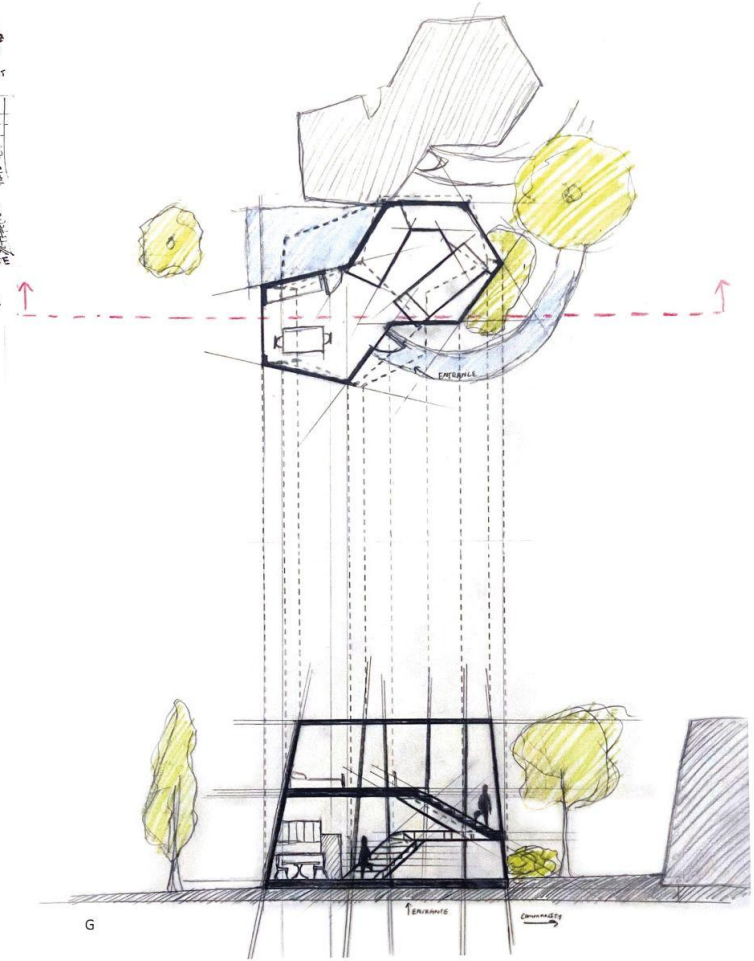
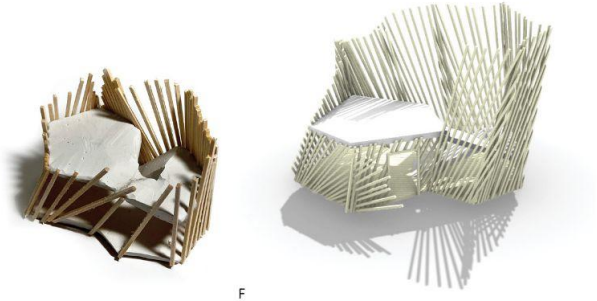
6
- SPACE IMAGES FORM
- NOTHING FORM
IMAGE CANNOT BE SPACE
PATH & NODE
NODE


- LIGHT COMES FIRST
- SIMPLICITY
CENTRALIZED ORGANIZATION
LINEAR ORGANIZATION
RADIAL ORGANIZATION
CLUSTER ORGANIZATION
GRID ORGANIZATION
#1 CONCRETE
#2 WOOD
#3 GLASS


ENTRANCE
ENTRANCE
COMMUNITY

A B C D



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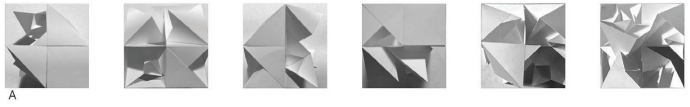
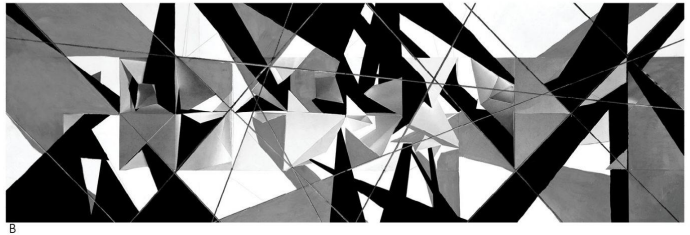
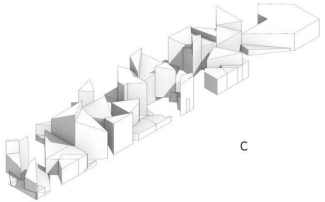
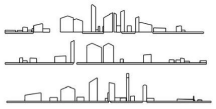
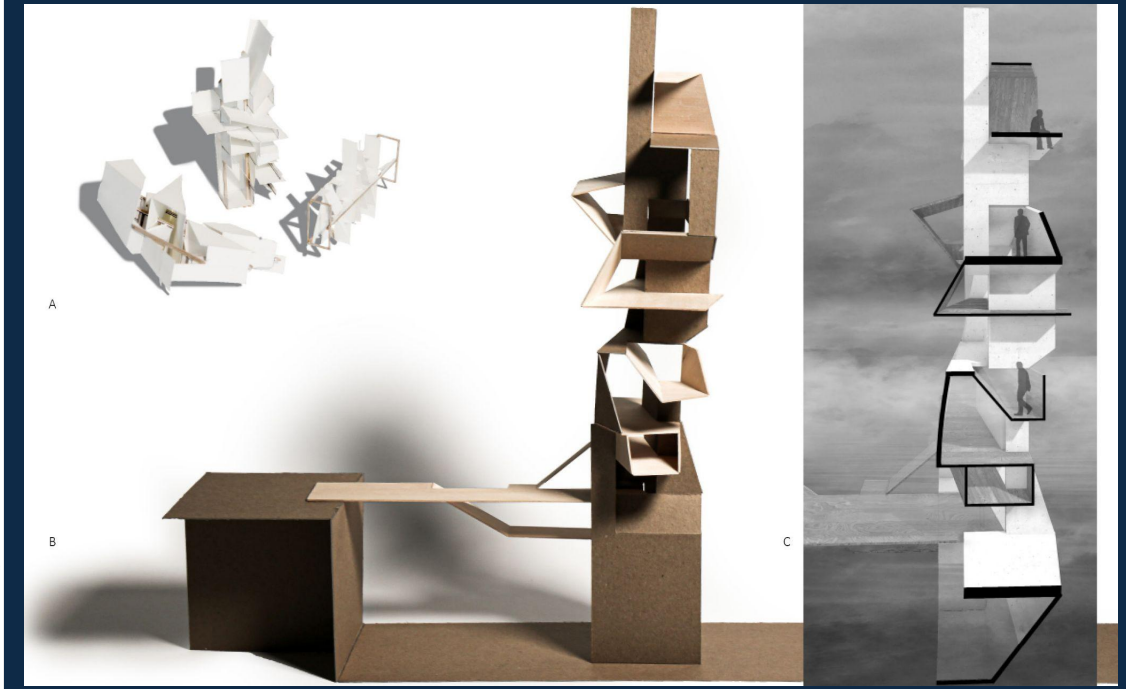




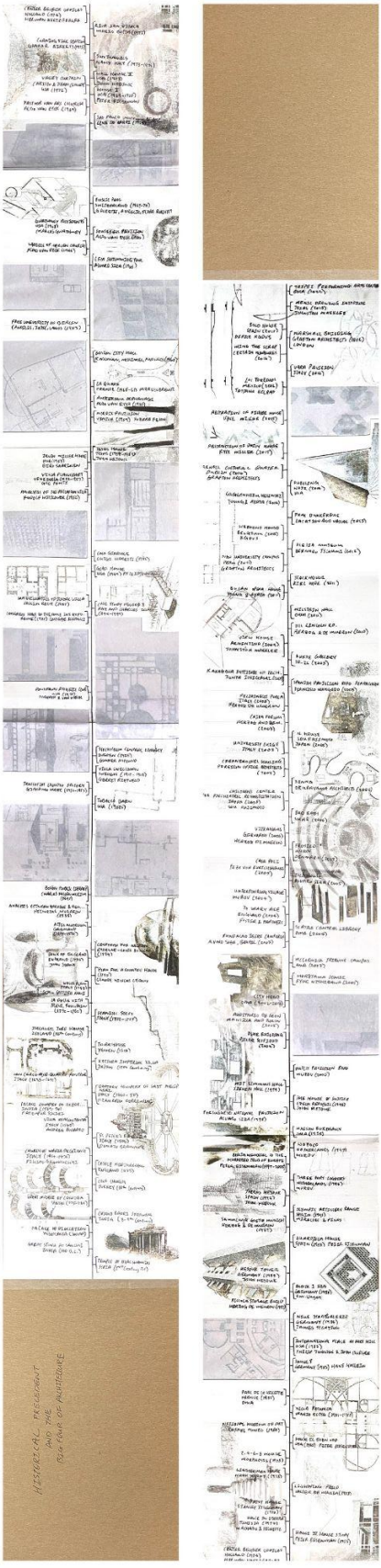




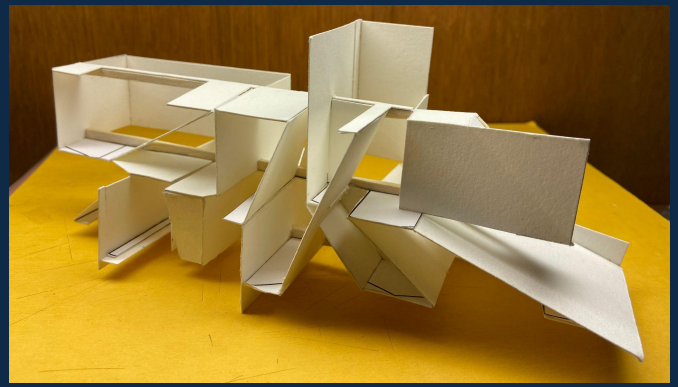
Cornell University - Arch1110
Summer 2022



Cornell University - Arch1110
Summer 2022



Cornell University - Arch1300
Summer 2022




SKINNY
POP
POPCORN

Design Problem

More than 2,000 octagon houses have been built. They were especially popular in the mid 1800's, when eight-sided houses were among the most unique Victorian-era homes built in the US and Canada.

Some of the original octagon houses are now museums. Other more modest versions remain, and some have been built fairly recently.

After visiting an octagon home in Key West, Florida, a New Jersey family is interested in building a modern, full octagon home on a lot they own at the Jersey shore. They hope that at least half the rooms in their new home will have ocean views.

Design Brief

Design a modern 2,000 square foot octagon home for a 100’ x 100’ lot at the shore. Each of the 2 floors should be 1,000 square feet. A deck for the 1st floor great room, and a balcony for the 2nd floor primary bedroom, should be included within the footprint of the perfect octagon.

Specifications/Drawing Requirements:

- Working drawings that include a floor plan as well as front, side and rear elevations;
- Include notes that identify at least 5 advantages of an octagon home;
- Include any other views that will enhance the presentation;
- Use proper scale, dimensions and notes;
- The maximum paper size is 24” x 36” or smaller sheets mounted on a 24” x 36” sheet with no overlapping papers.

Architectural Precedent

One of the most important step in the design and analytical iterative process.

Poplar Forest, Virginia
1806

The Langworthy House, Iowa
1856

Experimentation & Brainstorming

Using precedents to explore ideas and work with design, program, and site restrictions

Building Coastal Homes:

↳ Beach House relationship with Waves
↳ Hurricane winds,
  ↳ different pressure → blow off roof
  ↳ water weights

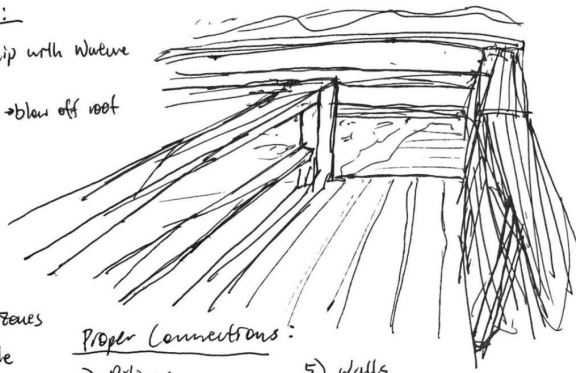
Know your location
Elevate the house
Open Lower Area
Use proper connections

Zone A or B coastal zones

Foundation: most pile

Piles: drivers
augering
jetting

↳ takes into account:
- upward and lateral forces
- contents of the house
- lateral forces of wind
- downward weight
- anticipated soil erosion



Proper Connections:

1) Pilings
2) Lateral supports
3) Floor Beam
4) Floor Joist
5) Walls
6) Roof Rafter
7) Roof sheathing

✱ Connections should be galvinized ✱

↳ Angular ring nails offsets wind uplake and forces.

Utilities:

→ Not exposed to Natural forces
→ Condenser unit for the air conditioner is enclosed to prevent debris

Under Elevated Building:

→ Break away walls
→ fascrice walls
→ screening

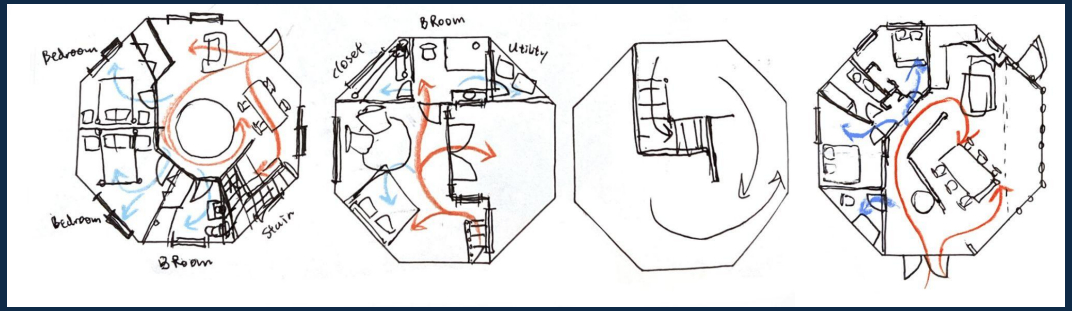
} to make area underneath more aesthetically pleasing

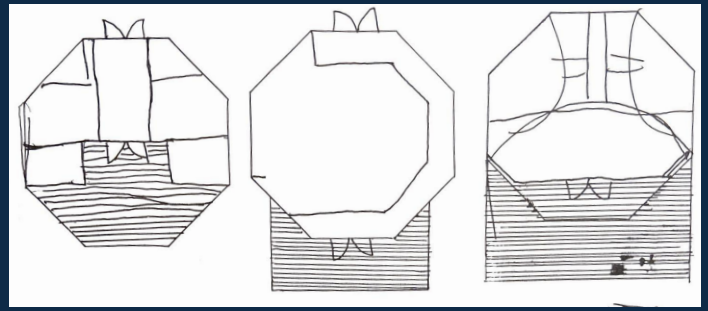
→ NO increase additional forces

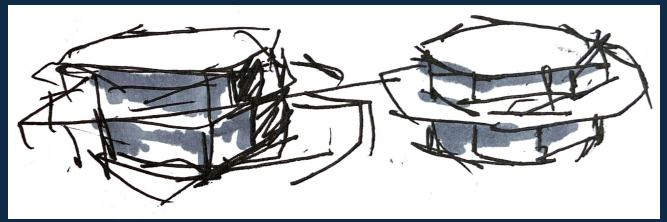
Insurance:

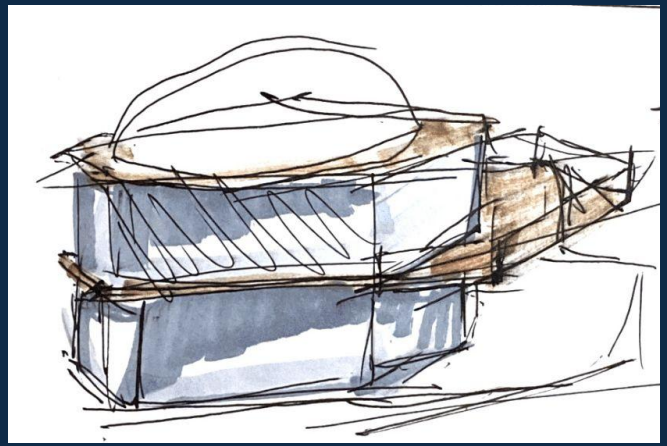
→ Flood elevation
  ↳ break away walls
  ↳ below area is not used a living space

→ State and municipality codes


Bedroom
Bedroom
BRoom
BRoom
closet
Utility
stair

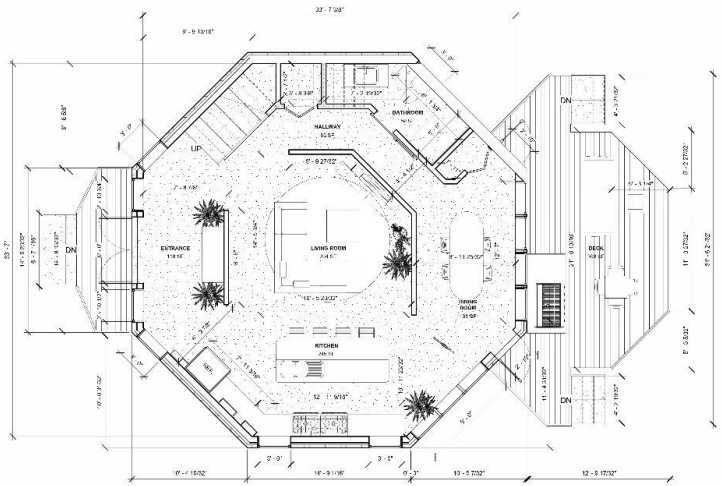






Digitalization

Production of materialized building using applications like Autodesk Revit and Adobe Photoshop



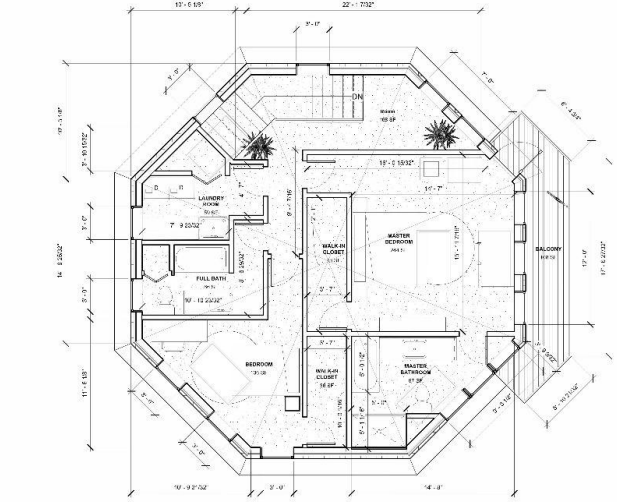
1 FIRST FLOOR
1/4" = 1'-0"

6 FRONT ELEVATION
3/16" = 1'-0"

3 REAR ELEVATION
3/16" = 1'-0"

4 RIGHT ELEVATION
1/8" = 1'-0"

5 LEFT ELEVATION
1/8" = 1'-0"



2 SECOND FLOOR
1/4" = 1'-0"

7 FIRST FLOOR PARAMETRIC 3D VIEW

8 SECOND FLOOR PARAMETRIC 3D VIEW

ADVANTAGES OF AN OCTOGON HOUSE:

1. MAXIMIZED SCENIC AND OUTDOOR VIEWS
2. NATURAL TRAFFIC AND AIR CIRCULATION
3. INCREASED SPACE AND MATERIAL EFFICIENCY
4. INCREASED NATURAL LIGHTING
5. MORE COST-EFFECTIVE AND STRUCTURALLY STABLE

OCTOGON HOUSE
TECHNOLOGY STUDENT ASSOCIATION

STUDENT ID# 2205003
SCHOOL YEAR: 2024/25
SHEET # 1 OF 1 SCALE

THANK YOU

$p(D)y = f(t)$

$$W(f_1, \ldots, f_n)(x) = \begin{vmatrix} f_1(x) & f_2(x) & \cdots & f_n(x) \\ f_1'(x) & f_2'(x) & \cdots & f_n'(x) \\ \vdots & \vdots & \ddots & \vdots \\ f_1^{(n-1)}(x) & f_2^{(n-1)}(x) & \cdots & f_n^{(n-1)}(x) \end{vmatrix}, \quad x \in I.$$

∂ifferential ɛquations

Lucas Sabol

$$\mathcal{L}\{f\}(s) = \int_0^{\infty} f(t)e^{-st}\,dt.$$

$\partial^2 u/\partial t^2 = c^2 \nabla^2 u$

What is a differential equation?

- Relates one or more functions and their “derivatives”

- In essence, a derivative is a “rate of change”

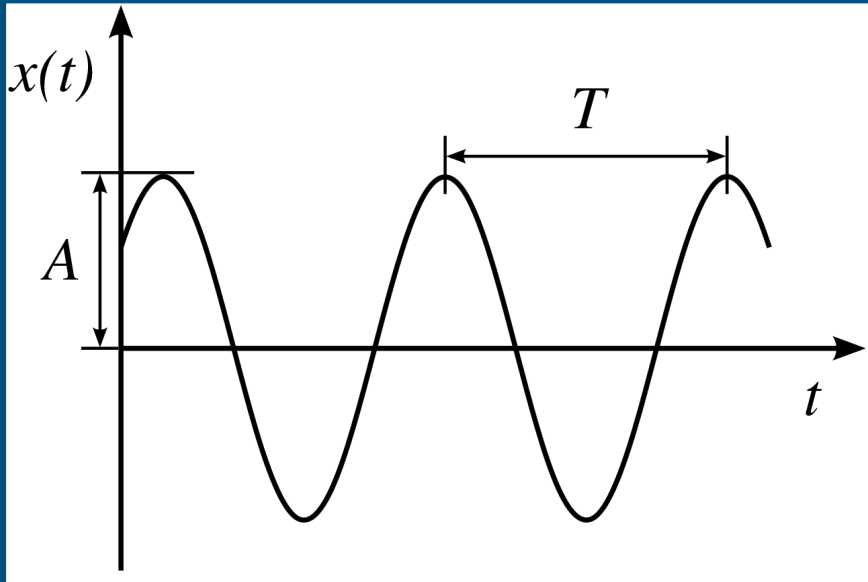
Example: Simple Harmonic Motion

$x''(t) = -\omega^2 x(t)$ (simple harmonic motion)

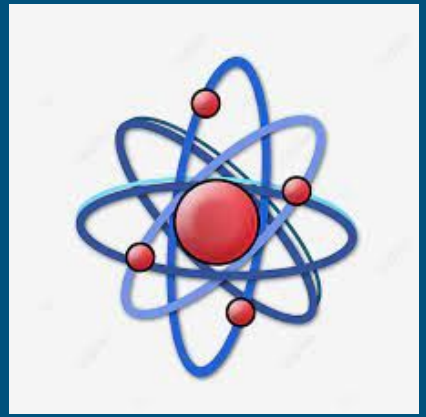
Time (t) is independent variable

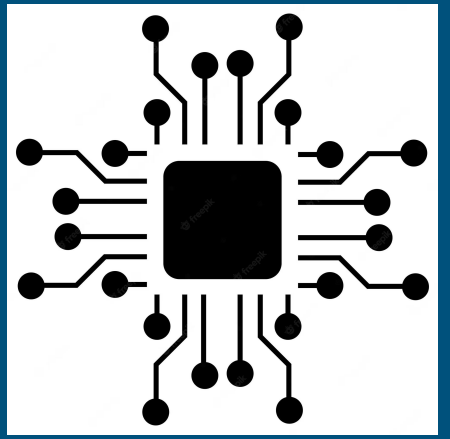
x(t) refers to displacement

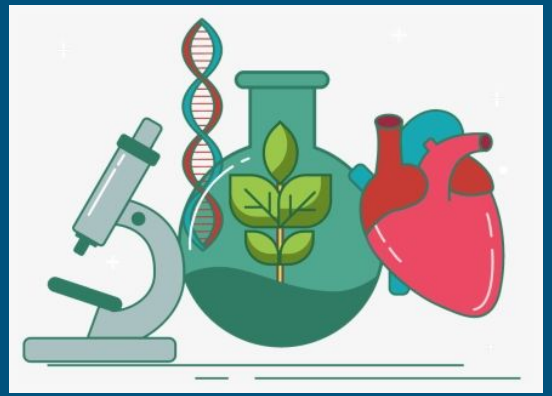
x”(t) refers to acceleration



Why Differential Equations?







MIT 18.034: Honors Differential Equations (Spring 2009)

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18.034 | Spring 2009 | Undergraduate

Honors Differential Equations

Syllabus
Calendar
Lecture Notes and Readings
Recitations
Assignments
Exams
Projects
Related Resources

Lecture Notes and Readings

Required readings are listed in the table below. Also included are lecture notes developed by the instructor to supplement the reading assignments. There are no supplementary notes for L15-18 and L31-35.

[BR] = section numbers in Birkhoff, Garret, and Gian-Carlo Rota. *Ordinary Differential Equations*. 4th ed. New York, NY: Wiley, 1989. ISBN: 9780471860037.

SES #	TOPICS	LECTURE NOTES	READINGS
L0	Terminology and implicit solutions	(PDF)	[BR] Sec. 1.1 Terminology & Implicit Solutions
Unit I: First-order differential equations			
L1	Integration and solutions	(PDF)	[BR] Sec. 1.2 Fundamental Theorem of the Calculus & Method by Quadrature
L2	Fundamental principles	(PDF)	[BR] Sec. 1.9 Fundamental Principles - Linearity, Existence and Uniqueness, Stability
L3	First-order linear equations	(PDF)	[BR] Sec. 1.3 First-order Linear Equations & Logarithmic Spirals
L4	Separable equations	(PDF)	[BR] Sec. 1.4 Separable Equations & Orthogonal Trajectories
L5	Linear fractional equations	(PDF)	[BR] Sec. 1.7 Linear Fractional Equations
Unit II: Second-order linear equations			
L6	Second-order linear equations	(PDF)	[BR] Sec. 2.1-2.2 Second-order Linear Equations
L7	Mechanical oscillation	(PDF)	
L8	Uniqueness and the wronskian	(PDF)	[BR] Sec. 2.4-2.5 Uniqueness & the Wronskian
L9	Separation and comparison theorems	(PDF)	[BR] Sec. 2.6 Separation and Comparison Theorems
L10	The maximum principle	(PDF)	
Unit III: Higher-order linear equations			
L11	Higher-order linear equations	(PDF)	[BR] Sec. 3.1-3.3 The Characteristic Polynomial
L12	Solution bases	(PDF)	[BR] Sec. 3.4 Solution Bases - Existence & Uniqueness
L13	Inhomogeneous equations	(PDF)	[BR] Sec. 3.5 Inhomogeneous Equations
L14	Stability	(PDF)	[BR] Sec. 2.3, 3.7 Asymptotic Stability
L15	Wellposedness; introduction		[BR] Sec. 6.2, 6.6 Wellposedness; Introduction
L16	Uniform convergence		[BR] Sec. 6.7, 6.9 Picard's Iteration
L17	Uniqueness and continuity		[BR] Sec. 6.3, SS1.9-1.10 Uniqueness and Continuity
L18	Remarks on wellposedness		[BR] Sec. 6.5, 6.8, 6.10 Remarks on Wellposedness
Unit V: The Laplace transform			
L19	Laplace transform	(PDF)	
L20	Transform and differential equations: generalized solutions, application to ODEs	(PDF)	
L21	Step functions	(PDF)	
L22	Convolution	(PDF)	
L23	The dirac distribution	(PDF)	
L24	The transfer function and the pole diagram	(PDF)	
Unit VI: The linear systems			
L25	Linear systems	(PDF)	[BR] Sec. 5.4 Matrices & Linear Systems
L26	Eigenvalues and eigenvectors	(PDF)	[BR] Sec. 5.4 Eigenvalues & Eigenvectors
L27	Complex solutions and the fundamental matrix	(PDF)	
L28	Repeated eigenvalues and the matrix exponential	(PDF)	[BR] Appendix A1-2 Repeated Eigenvalues & Matrix Exponential
L29	Phase planes I	(PDF)	[BR] Sec. 5.5 Phase Planes
L30	Phase planes II	(PDF)	[BR] Sec. 5.5 Phase Planes; Degenerate cases
L31	Plane autonomous system		[BR] Sec. 5.1-5.2, 5.7 Plane Autonomous System
L32	Stability and almost linear systems		[BR] Sec. 5.7-5.8 Stability and Almost linear systems
L33	Problems from ecology		
L34	Methods of Lyapunov		[BR] Sec. 5.7-5.8 Methods of Lyapunov
L35	Nonlinear oscillations		[BR] Sec. 5.9-5.11 Nonlinear Oscillations
L36	The Poincare-Bendixson theorem	(PDF)	[BR] Sec. 5.12 The Poincare-Bendixson Theorem

Course Info

INSTRUCTOR
Dr. Vera Mikyoung Hur

DEPARTMENTS
Mathematics

AS TAUGHT IN
Spring 2009

LEVEL
Undergraduate

TOPICS
Mathematics
Differential Equations
Linear Algebra

LEARNING RESOURCE TYPES
Problem Sets with Solutions
Lecture Notes
Projects with Examples

Download Course

18.034 Practice Midterm #2

Notation. $' = d/dt$.

1. (a) Find numbers a and b so that the differential equation $t^2y'' + aty' + by = 0$ has solutions t^2 and t^3 on the interval $t \in (0, \infty)$.
(b) Find a differential equation that has solutions $(1-t)^2$ and $(1-t)^3$ on the interval $t \in (-\infty, 1)$.
(c) Find a differential equation that has solutions t and e^t.

2. Using *variation of parameters* find a solution of $y'' - (2/t^2)y = t, t \neq 0$.

3. Find a general solution of $(D^2-1)^4(D^3+1)^5y = 3e^t$.

4. Show that the function $u = e^{\int z}$ is a solution of $y'' + p(t)y' + q(t)y = 0$ if and only if z is a solution of the Riccati equation $y' + p(t)y + q(t) = -y^2$.

5. (a) State *the existence and uniqueness theorem* for the initial value problem

$$y' = f(t, y), \qquad y(t_0) = y_0.$$

(b) Show that $f(t, y) = -y + 1$ satisfies the Lipschitz condition for all t and y.
(c) Using Picard's iteration method obtain the iterate $y_1(t)$ and $y_2(t)$ of

$$y' = -y + 1, \qquad y(0) = 1.$$

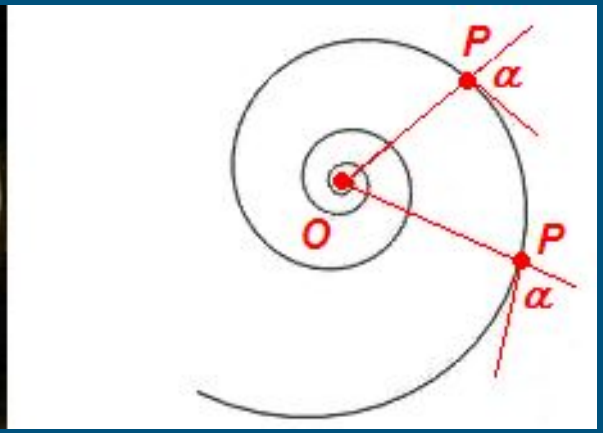
(d) Find the exact solution of the initial value problem in part (c).

Project Suggestions

Some sample topics include:

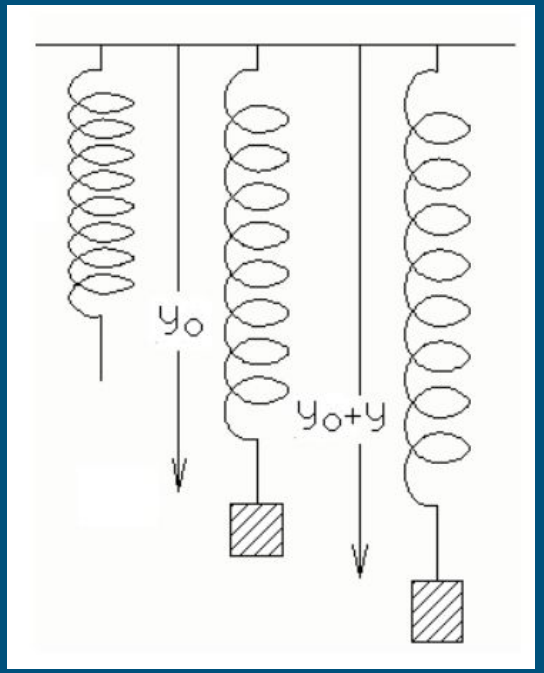
- Green's functions for the Dirichlet boundary condition;
- Solution by a power series method and the method of majorants;
- Smoothness of the initial value problem;
- The stationary Schrodinger equation as a Sturm-Liouville system;
- Numerical methods of solving differential equations;
- Planetary motion and conservation laws;
- Bifurcation theory and elastic rods;
- Can one hear the shape of a drum?
- Linear instability of a free-surface shear flows due to boundary singularity, etc.

Applications



$r\, d\theta/dr = \tan(\pi - \alpha)$

r = radius
θ = angular coordinate
α = *constant angle*



$my'' + ky = 0$

m = mass
k = spring constant
y = displacement from rest state

Theory

$$\frac{\partial \mathbf{v}}{\partial t} + (\mathbf{v} \cdot \nabla)\mathbf{v} = -\frac{1}{\rho}\nabla p + \nu \Delta \mathbf{v} + \mathbf{f}(\boldsymbol{x}, t)$$

- Major field of study in mathematics
- Find properties of solutions without solving
- Practice with logic and mathematical exposition

Project: Vibrations of Drumheads

- What can we determine about the frequencies produced by a vibrating drum knowing the shape of the drumhead?

- What can we determine about the shape of the drumhead knowing the frequencies produced when it vibrates?

Thank you!

WEST ESSEX REGIONAL SCHOOL DISTRICT 2023-2024 BUDGET


Budget maintains existing district staff, academic offerings, extra-curricular activities, and regular transportation
NEW:
Additional staff,2nd Class 3 Officer, Middle School Hallway renovations, additional security cameras
Meets the increases of salaries and benefits and operational costs
Improving the Academic Environment of West Essex

BUDGET INFORMATION

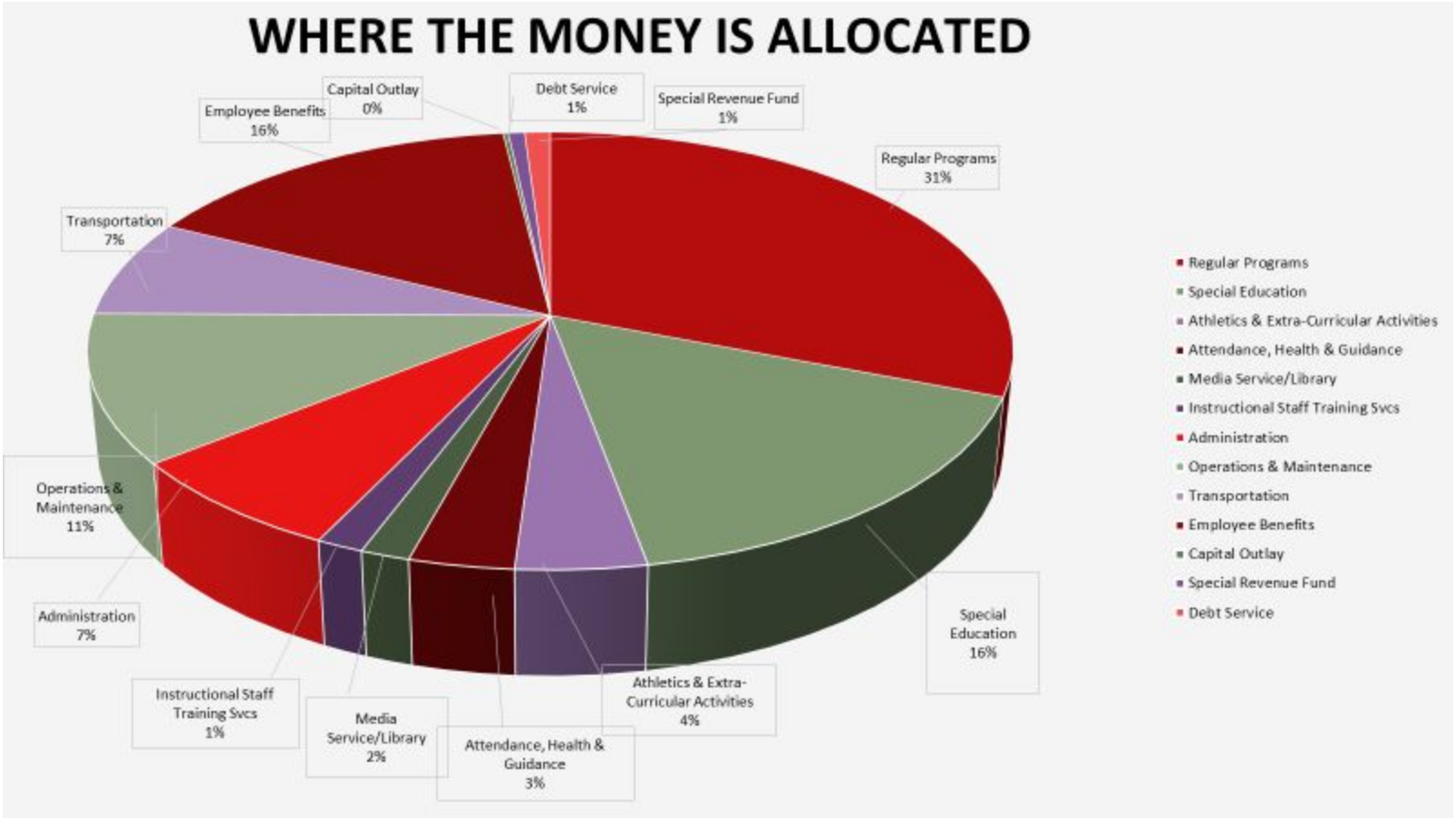
BREAKDOWN OF BUDGET

Fund	2023-2024
Total General Fund	$ 44,934,747
Total Special Revenue Fund	$ 302,000
Total Debt Service Fund	$475,363
Totals:	$ 45,712,110

DETAILED EXPENDITURE BREAKDOWN

Overall Budget spending is:	2022-2023 Budget (Revised 2/1/2023)	2023-2024 Proposed Budget	$ Change	% Change
Instruction:				
Regular Programs	$ 13,685,330	$ 14,125,056	$ 439,726	3.21%
Special Education	$ 2,332,507	$ 2,574,746	$ 242,239	10.39%
Services:				
Extra-Curricular Activities	$ 343,829	$ 385,300	$ 41,471	12.06%
Athletics	$ 1,427,879	$ 1,408,266	$ (19,613)	-1.37%
Tuition	$ 3,356,096	$ 3,468,772	$ 112,676	3.36%
Attendance, Health Svcs, Guidance	$ 1,272,586	$ 1,445,562	$ 172,976	13.59%
Child Study Team	$ 1,444,196	$ 1,371,578	$ (72,618)	-5.03%
Instructional Staff Training Services	$ 583,310	$ 652,170	$ 68,860	11.81%
Media/Library Services	$ 660,463	$ 680,069	$ 19,606	2.97%
General Administration	$ 952,009	$ 868,275	$ (83,734)	-8.80%
School Administration	$ 1,833,510	$ 1,855,088	$ 21,578	1.18%
Central Services & Info Tech	$ 572,630	$ 525,303	$ (47,327)	-8.26%
Operations and Maintenance of Plant	$ 4,646,900	$ 4,990,967	$ 344,067	7.40%
Transportation	$ 3,475,682	$ 3,315,200	$ (160,482)	-4.62%
Employee Benefits	$ 6,952,832	$ 7,170,025	$ 217,193	3.12%
Capital Outlay	$ 311,508	$ 98,370	$ (213,138)	-68.42%
Special Revenue Funds	$ 866,918	$ 302,000	$ (564,918)	-65.16%
Debt Service	$ 2,000,513	$ 475,363	$ (1,525,150)	-76.24%
TOTAL:	$46,718,698	$45,712,110	$ (1,006,588)	-2.15%

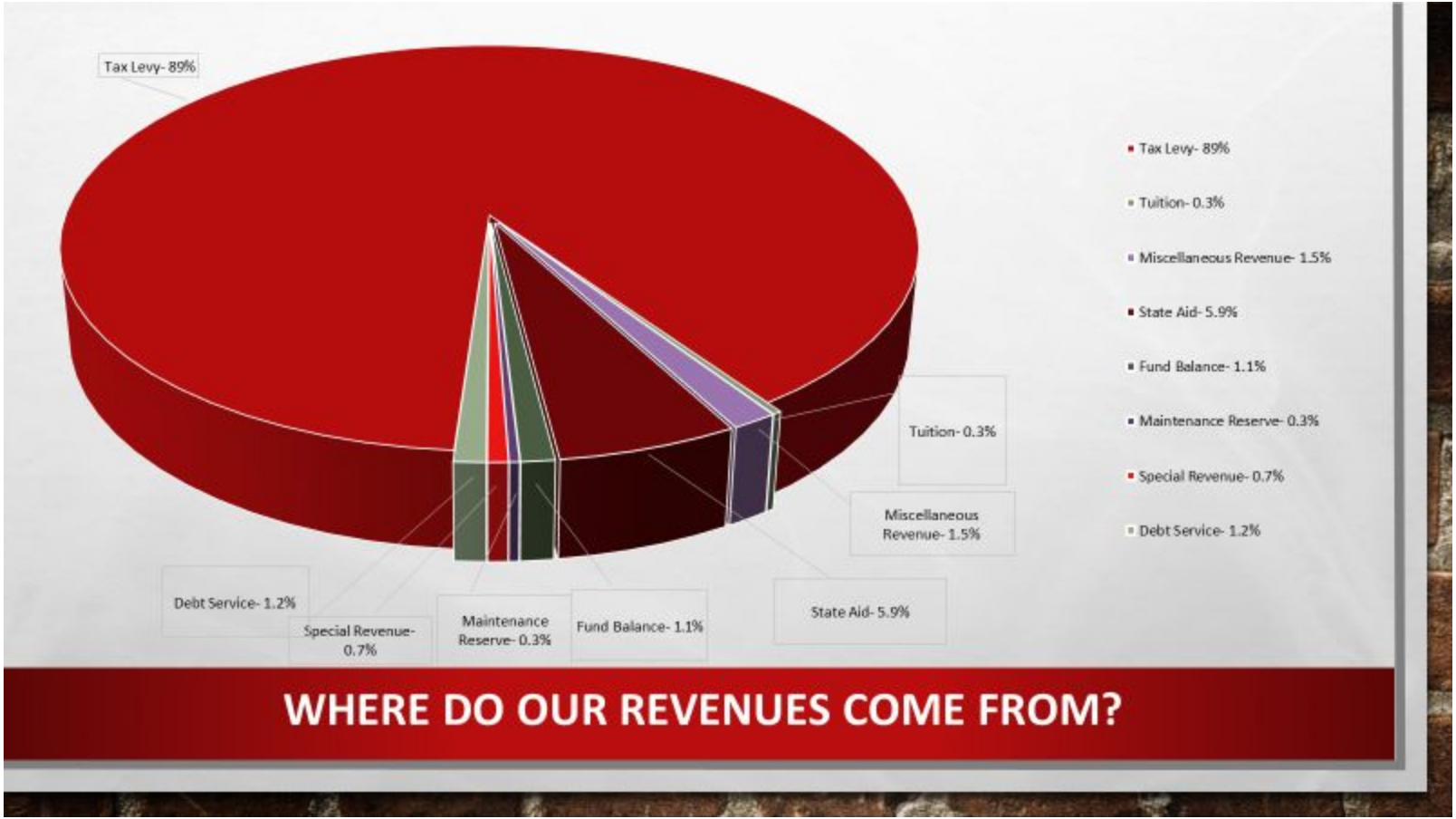
WHERE THE MONEY IS ALLOCATED



REVENUES
AND
TAX INFORMATION

DETAILED REVENUE BREAKDOWN

Overall Budget spending is:	2022-2023 Budget	2023-2024 Proposed Budget	$ Change	% Change
Tax Levy	$ 39,635,357	$ 40,809,907	$ 1,174,550	2.96%
Tuition	$ 130,000	$ 130,000	$ 0	0.00%
Miscellaneous Revenue	$ 549,186	$ 675,000	$ 125,814	22.91%
State Aid	$ 2,298,224	$ 2,669,840	$ 371,616	16.17%
Budgeted Fund Balance	$ 612,532	$ 500,000	$ (112,532)	-18.37%
Capital Reserve	$ 127,000	$ 0	$ (127,000)	-100.00%
Maintenance Reserve	$ 100,000	$ 150,000	$ 50,000	50.00%
Encumbrances	$ 398,968	$ 0	$ (398,968)	-100.00%
Grant Money (Local Sources)	$ 0	$ 0	$ (84,744)	-100.00%
Federal Grants	$ 866,918	$ 302,000	$ (564,918)	-65.16%
Debt Service	$ 2,000,513	$ 475,363	$(1,525,150)	-76.24%
TOTAL:	$ 46,718,698	$ 45,712,110	$(1,006,588)	-2.15%


Tax Levy- 89%
Tuition- 0.3%
Miscellaneous Revenue- 1.5%
State Aid- 5.9%
Fund Balance- 1.1%
Maintenance Reserve- 0.3%
Special Revenue- 0.7%
Debt Service- 1.2%
Tax Levy- 89%
Tuition- 0.3%
Miscellaneous Revenue- 1.5%
State Aid- 5.9%
Fund Balance- 1.1%
Maintenance Reserve- 0.3%
Special Revenue- 0.7%
Debt Service- 1.2%
WHERE DO OUR REVENUES COME FROM?

	BUDGET 2023	TOTAL TAX LEVY 2023	BUDGET 2024	TOTAL TAX LEVY 2024
TOTAL GENERAL FUND	$43,221,113	$39,635,357	$44,934,747	$40,809,907
TOTAL SPECIAL REVENUE FUND	$302,000	$0	$302,000	$0
TOTAL DEBT SERVICE FUND	$2,000,513	$2,000,513	$475,363	$475,363
TOTALS:	$45,523,626	$41,635,870	$45,712,110	$41,285,270

BUDGET COMPARISON 2022-23 VS. 2023-24


Expenditures
$45,712,110
Revenues
$4,426,840
Tax Levy
$41,285,270
Balancing District Needs with Local Funding

TAX IMPACT

REGIONAL SENDING DISTRICTS' TAX IMPACTS MAY VARY YEARLY DUE TO ENROLLMENT AND EQUALIZED VALUATION OF OUR MUNICIPALITIES IN COMPARISON

Municipality	2022-23 % share	2023-24 % share	% Share Change	2023-24 Tax Rate (per $100)	Average Assessed Home	2022-2023 Property Tax for WERSD	2023-2024 Property Tax for WERSD	Average Increase/ (Decrease)	Increase/ (Decrease) Per Month
Essex Fells	7.3474256	6.9918540	(0.3555716)	.38	$937,969	$3,791.59	$3,591.84	$(199.65)	$(16.64)
Fairfield	45.4276825	46.6372889	1.2096064	.60	$529,188	$3,477.11	$3,181.50	$(295.61)	$(24.63)
N. Caldwell	24.1840773	24.9888181	0.8047408	.55	$794,100	$4,199.55	$4,300.97	$101.42	$8.45
Roseland	23.0408146	21.3820390	(1.6587756)	.56	$470,368	$2,724.64	$2,510.21	$(214.43)	$(17.87)

**This slide is for informational purposes only. Amounts are estimated and are subject to change.
*Information as of March 2023.

THANK YOU!


TEACHERS
PARENTS
STAFF
STUDENTS
BOE
COMMUNITY
ADMINISTRATORS

Superintendent's Report

- Best of luck in retirement - Lorna Danckwerth
- Academic Achievement Day - April 5, 2023
- 3 Unused Emergency/Snow Days
  Monday, May 15 - Happy Mother's Day!
  Friday, May 26 - Memorial Day Weekend
  Tuesday, May 30 - Memorial Day Weekend
- Tuesday, April 25 - District Orchestra Concert - High School Auditorium
- Special Olympics - Wednesday, April 26 (100m run, SB throw, 50m walk, Standing LJ)
- Thursday, April 27 - High School Band Concert - High School Auditorium

Middle School Principal's Report

Gina Donlevie, Principal

- Special Olympics *(April 26)*
- Take Your Child to Work Day *(April 27)*
- Staff Appreciation Week *(May 1-5)*
- NJSLA Testing *(May 8-11)*

High School Principal's Report

Caesar Diliberto, Principal

- Congratulations to ShopRite STARS for 3rd Marking Period:

  ACADEMICS - Raeva Patwardhan (11th)
  ATHLETICS - Joseph Ganton (12th)
  THE ARTS - Hailey Levenberg (11th)
  LEADERSHIP - Marlee Perlmutter (11th)
  SERVICE TO THE COMMUNITY - Eliana Rosen (11th)

- AP Testing begins next Monday
  - 290 students will take 810 exams in 27 subjects

- NJSLA - Tuesday, May 16 through Friday, May 19

Upcoming Board Meetings

Next Regular Meeting

Monday, May 8, 2023 at 7:30 p.m.

West Essex Middle School - Room 121

West Essex Youtube

For Board Information:
https://www.westex.org/district/board_of_education