

[Open-Source CEM and Additive Manufacturing, Year 1]										15%													
[Whittier College]																							
[Prof. J. Hanson, F. Park, S. Zorba, S. Lagan, G. Piner]										Friday, June 30, 2023													
[Nayeli Camacho, Shaun Dunnick]																							
WBS	Task Names	Responsible Colleagues	Start	Finish	% Complete	Net Week Days	Days Completed	Days Remaining	Days to Deadline	Jul 2024	Aug 2024	Sept 2024	Oct 2024	Nov 2024	Dec 2024	Jan 2025	Feb 2025	Mar 2025	Apr 2025	May 2025	Jun 2025	Jul 2025	Aug 2025
Hardware Acquisition (Weight=10%)	3D Printer Acquisition	[Prof. Hanson, N. Camacho, F. Park]	01-Jul-2024	300	18%	300	0	300	785														
	Obtain quotes	[N. Camacho]	01-Jul-2024	34	15-Aug-2024	100%	34	34	0	412													
	Complete purchase	[N. Camacho]	01-Jul-2024	6	08-Jul-2024	100%	6	6	0	374													
	3D Printer Filament Acquisition	[N. Camacho]	01-Jul-2024	6	08-Jul-2024	100%	6	6	0	374													
	Obtain quotes	[N. Camacho]	10-Jul-2024	4	15-Jul-2024	100%	4	4	0	381													
	Complete purchase	[N. Camacho]	10-Jul-2024	4	15-Jul-2024	100%	4	4	0	381													
	GPU/Multicores Server	[F. Park]	01-Jul-2024	24	01-Aug-2024	100%	24	24	0	398													
	Perform market comparison	[Prof. Hanson]	01-Aug-2024	10	14-Aug-2024	100%	10	10	0	411													
	Obtain quotes	[N. Camacho]	14-Aug-2024	2	15-Aug-2024	100%	2	2	0	412													
	Complete purchase	[N. Camacho]	14-Aug-2024	2	15-Aug-2024	100%	2	2	0	412													
RF Lab Hardware	[Prof. Hanson]	01-Jul-2024	24	01-Aug-2024	100%	24	24	0	398														
RF cables and connectors	[Prof. Hanson]	01-Jul-2024	24	01-Aug-2024	100%	24	24	0	398														
Recruitment (Weight=5%)	Standard undergraduate recruitment procedure	[Prof. Hanson]	23-Aug-2024	22	23-Sep-2024	0%	22	0	22	451													
Undergraduate STEM researchers	[Prof. Hanson]	23-Aug-2024	22	23-Sep-2024	0%	22	0	22	451														
Undergraduate app/code designers	[Prof. Hanson]	23-Aug-2024	22	23-Sep-2024	0%	22	0	22	451														
Run Published CEM Codes (Weight=5%)	Initial CEM Training, Linux Accts.	[Prof. Hanson, Undergraduates 1,2]	23-Sep-2024	12	08-Oct-2024	0%	12	0	12	466													
CEM Training	[Prof. Hanson, Undergraduates 1,2]	23-Sep-2024	6	30-Sep-2024	0%	6	0	6	458														
Account creation	[Prof. Hanson]	23-Sep-2024	6	30-Sep-2024	0%	6	0	6	458														
Updating CEM Code	[Prof. Hanson]	23-Sep-2024	12	08-Oct-2024	0%	12	0	12	466														
Unpack and test original code	[Prof. Hanson]	23-Sep-2024	12	08-Oct-2024	0%	12	0	12	466														
Course Integrations (Weight=10%)	Physics Courses	[Prof. Hanson, Lagan, Zorba, Piner]	01-Jul-2024	300	23-Aug-2025	0%	300	0	300	785													
Algebra-Based Physics II	[Prof. Hanson]	01-Jul-2024	11	15-Jul-2024	0%	11	0	11	381														
Calculus-Based Physics II	[Prof. Hanson]	01-Jul-2024	11	15-Jul-2024	0%	11	0	11	381														
Optics	[Prof. Zorba and Hanson]	15-Dec-2024	23	15-Jan-2025	0%	23	0	23	565														
Electromagnetic Theory	[Prof. Hanson]	01-Jul-2024	40	23-Aug-2024	0%	40	0	40	420														
Computational Physics	[Prof. Lagan and Hanson]	15-Dec-2024	23	15-Jan-2025	0%	23	0	23	565														
Computer Science Courses	Computer Logic and Digital Circuit Design	[Prof. Hanson]	15-May-2025	72	23-Aug-2025	0%	72	0	72	785													
Digital Signal Processing	[Prof. Hanson]	01-Aug-2025	16	23-Aug-2025	0%	16	0	16	785														
Introduction to Data Science with Python	[Prof. Hanson and Piner]	01-Jul-2024	40	23-Aug-2024	0%	40	0	40	420														
Machine Learning	[Prof. Hanson and Park]	15-Jan-2025	87	15-May-2025	0%	87	0	87	685														
Primary CEM Research, Semesters 1, 2 (Weight=10%)	CEM Simulations, Data Visualization	[Prof. Hanson, Undergraduates 1,2]	23-Aug-2024	190	15-May-2025	50%	190	95	95	685													
3D visualization of RF horn design	[Prof. Hanson, Undergraduate 1]	23-Sep-2024	7	01-Oct-2024	100%	7	7	0	459														
Time-domain computations, phase analysis	[Prof. Hanson, Undergraduate 1]	01-Oct-2024	24	01-Nov-2024	100%	24	24	0	490														
S-Parameters analysis	[Prof. Hanson, Undergraduate 1]	01-Oct-2024	24	01-Nov-2024	100%	24	24	0	490														
Inclusion of coaxial cable in simulation	[Prof. Hanson, Undergraduate 1]	01-Nov-2024	31	15-Dec-2024	50%	31	15	16	534														
Machine Learning Optimization	Background research for algorithms	[Prof. Hanson, Undergraduate 2]	23-Sep-2024	30	01-Nov-2024	100%	30	30	0	490													
Learning genetic programming styles	[Prof. Hanson, Undergraduate 2]	23-Sep-2024	30	01-Nov-2024	100%	30	30	0	490														
CEM implementation with basic RF horn	[Prof. Hanson, Undergraduate 2]	01-Nov-2024	54	15-Jan-2025	25%	54	13	41	565														
RF antenna optimization	[Prof. Hanson, Undergraduate 2]	15-Jan-2025	87	15-May-2025	0%	87	0	87	685														
Additive Manufacturing, Semesters 1, 2 (Weight=10%)	Printing with PLA Filament	[S. Dunnick, Prof. Hanson, Undergrads]	01-Jul-2024	229	15-May-2025	0%	229	0	229	685													
Updating prior designs	[S. Dunnick, Prof. Hanson]	01-Jul-2024	40	23-Aug-2024	0%	40	0	40	420														
Practice file format conversion	[S. Dunnick, Prof. Hanson]	01-Jul-2024	40	23-Aug-2024	0%	40	0	40	420														
Print test object	[S. Dunnick, Prof. Hanson]	01-Jul-2024	40	23-Aug-2024	0%	40	0	40	420														
Print PLA antenna model	[S. Dunnick, Prof. Hanson]	01-Jul-2024	40	23-Aug-2024	0%	40	0	40	420														
Printing with Electric Filament	Print test object	[S. Dunnick, Undergraduate 3]	23-Sep-2024	17	15-Oct-2024	0%	17	0	17	473													
Perform resistivity measurements	[S. Dunnick, Undergraduate 3]	15-Oct-2024	14	01-Nov-2024	0%	14	0	14	490														
Print simple antenna	[S. Dunnick, Undergraduate 3]	01-Nov-2024	31	15-Dec-2024	0%	31	0	31	534														
Print complex antenna	[S. Dunnick, Undergraduate 3]	15-Dec-2024	109	15-May-2025	0%	109	0	109	685														
Application Development, Semesters 1, 2 (Weight=10%)	Creating Project Plan with Students	[Prof. Hanson, Undergraduate 4]	23-Aug-2024	190	15-May-2025	0%	190	0	190	685													
Creating kanban taskflow	[Prof. Hanson]	23-Aug-2024	22	23-Sep-2024	0%	22	0	22	451														
Updating prior code	[Prof. Hanson]	23-Aug-2024	22	23-Sep-2024	0%	22	0	22	451														
Experimenting with Android SDK	[Undergraduate 4]	23-Sep-2024	60	15-Dec-2024	0%	60	0	60	534														
Designing Visual Environment	Updating prior designs	[Undergraduate 4]	15-Dec-2024	109	15-May-2025	0%	109	0	109	685													
Displaying content on Android app	[Undergraduate 4]	01-Feb-2025	74	15-May-2025	0%	74	0	74	685														
Primary CEM Research, Summer 2025 (Weight=20%)	CEM Simulations, Data Visualization	[Prof. Hanson, Undergraduates 1,2]	15-May-2025	72	23-Aug-2025	0%	72	0	72	785													
3D visualization of optimized antenna	[Prof. Hanson, Undergraduate 1]	15-May-2025	12	01-Jun-2025	0%	12	0	12	702														
S-Parameters in complex media	[Prof. Hanson, Undergraduate 1]	01-Jun-2025	10	15-Jun-2025	0%	10	0	10	716														
CEM for 3D arrays in complex media	[Prof. Hanson, Undergraduate 1]	15-Jun-2025	50	23-Aug-2025	0%	50	0	50	785														
RX/TX with phased arrays in complex media	[Prof. Hanson, Undergraduate 1]	15-Jun-2025	50	23-Aug-2025	0%	50	0	50	785														
Machine Learning Optimization	3D visualization of optimized antenna	[Prof. Hanson, Undergraduate 2]	15-May-2025	12	01-Jun-2025	0%	12	0	12	702													
Explore HFD array optimizations in ice	[Prof. Hanson, Undergraduate 2]	01-Jun-2025	60	23-Aug-2025	0%	60	0	60	785														
Additive Manufacturing, Summer 2025 (Weight=20%)	Printing with Electric Filament	[S. Dunnick, Undergraduates 1,3]	15-May-2025	72	23-Aug-2025	0%	72	0	72	785													
Updating prior designs	[S. Dunnick, Undergraduate 3]	15-May-2025	34	01-Jul-2025	0%	34	0	34	732														
Continue printing complex antenna	[S. Dunnick, Undergraduate 3]	15-May-2025	34	01-Jul-2025	0%	34	0	34	732														
Real S-parameter measurement	[Prof. Hanson, Undergraduate 3]	01-Jul-2025	39	23-Aug-2025	0%	39	0	39	785														
Real radiation pattern measurement	[S. Dunnick, Undergraduate 3]	01-Jul-2025	39	23-Aug-2025	0%	39	0	39	785														