



# Newton Moore Senior High School

## Science

### Year 8 Engineering Specialist

#### 2016



## Course Description

This course is divided into four (4), term long units which include bridge building, coding and 3D printing, robotics and motors and gears. Students will be involved in various types of learning activities involving self-paced work, online tutorials, explicit instruction, practical and theory work. This course aims to further enhance the problem-solving and team work skills developed in the Year 7 program, and the students' ability to evaluate their work and performance in project-based learning as part of the Technology Process.

## Technology Process

Students apply the knowledge and skills learnt throughout their units and the technology processes to performed assigned tasks and solve problems by:

- Investigating – Students investigate issues, needs and opportunities.
- Designing – Students devise and generate ideas in preparation for assembly.
- Producing – Students assemble, operate and manage production processes
- Evaluating – Students evaluate intentions, plans and actions

## Course Outline

Week	Content
Term 1	
1	Course introduction and Research- Types of bridges
2	Research- Types of Bridges & Advantages and Disadvantage
3	In class competition assignment, group organisation and reflection
4	Trusses and Truss design (scale plan)
5	Truss design- Struts, lateral bracing and portal bracing
6	Construction of bridges
7	Construction of bridges
8	Construction of bridges
9	Construction of bridges
10	Bridge testing and Journal submission
Term 2	
1	Engine to wheel connection, car body
2	Building model engine

<b>Week</b>	<b>Content</b>
3	Building model engine and support systems
4	Fuel System and ignition (including, starter, fuel)
5	Cylinder head, engines oil and cooling system
6	Automatic transmission, differential, brakes and clutch
7	Steering, suspension and tyres
8	Gears and Gear ratios
9	Gearing up and Gearing down
10	Apply your knowledge challenges
Term 3	
1	Introduction to Coding- Student log-ins & unplugged activity: Tangrams
2	Coding- Basic command: Navigating mazes and drawing
3	Coding- Variables
4	Coding- Loops
5	Coding- Functions and functions with parameters
6	Coding- Binary
7	Coding- Apply your knowledge challenges
8	Coding- Apply your knowledge challenges
9	3D printing investigation: Use and applications of 3D printing
10	3D printing investigation: Use and applications of 3D printing
Term 4	
1	Robotics introduction: Kit allocation, file set-up, construction of robots
2	Software overview and programming basics
3	Programming- Basics
4	Programming- Beyond Basics
5	Programming- Beyond Basics
6	Programming- Beyond Basics
7	Data logging
8	Data logging
9	Apply your knowledge tasks
10	Kit audit and reflection

This course outline may be subject to change, any changes will be communicated to students.

## Assessment Outline

Assessment Task	Outcome	Date Due	Max Score	% Weight
<b>Semester 1</b>				
Bridge Building	<b>Technology Process</b>	Week 10	100	25
Motors and Gears	<b>Technology Process</b>	Week 6	100	25
Semester 1 Total				50
<b>Semester 2</b>				
Coding	<b>Technology Process</b>	Week 20	100	25
Robotics	<b>Technology Process</b>	Week 35	100	25
Semester 2 Total				50
Total				100

The above weightings are intended to show the importance of each task. The allocation of a grade at the end of a semester is determined based on grade related descriptors issued by School Curriculum and Standards Authority.