OTUMOETAI COLLEGE

2011

NCEA LEVEL 3

YEAR 13

Design Technology Wood base

"Technology is more than students learning useful practical skills. Our society in 2011 onwards requires enquiring and resourceful minds with the right attitude to work, and the ability to seek out innovative solutions. They must also have the talent to think as an individual and the cooperative skills to work with others."

Teacher: Mr Meyer

	2011 Year 13 Programme	
1	Start skills based starter project	US 7530
2	Exploration of tools, safety, carving, hardware, finishes. Cutting lists, materials and processes.	
3	Begin research assignment on identifying a need	
4	Complete skills based starter project	US 7530
5	Start furniture project research and design	3.1 AS90618
6		
7		
8		
9		
10		
11		
	END OF TERM ONE HOLIDAYS	
1	Complete furniture project research and design	3.1 AS90618
2	Begin furniture project practical work	3.2 AS90625
3	Hand in research assignment for Pre-check	3.7 AS90687
4		
5	*Test and select materials for a design task in materials technology.*	US7529
6		
7		
8		
9		
10		
11		
	END OF TERM TWO HOLIDAYS	
1		
2		
3		
4		
5		
6		
7		
8		
9	Finish In depth study on materials and processes	3.6 AS90686
10		
	END OF TERM THREE HOLIDAYS	
1	Project Evaluation complete / Compile years work portfolio. All completed practical work to be handed in for display.	3.7 AS90687 Creative awards evening 3.6 AS90686
2		US 7526

PARENTS / GUARDIANS

This year your son / daughter has elected to study TECHNOLOGY for their National Certificate of Educational Achievement (NCEA) Level Three(Year 13). The purpose of this booklet is to detail the year's program and to indicate the way in which you in partnership with your child's teacher can make a positive contribution to the success of your child.

Each student will be issued with a copy of the course outline which informs the student of:

The Achievement Standards offered, their value and assessment.

(i) An assessment regime which indicates types of assessment offered.
(ii) A student record sheet for recording of grades.

On taking this course students will be working towards **Achievement Standards** and **Unit Standards**.

In Materials Technology this year students will be working towards gaining Level Three credits for the National Certificate of Educational Achievement.

The work you do throughout the year will be assessed in two different ways:

- Internal Assessment – assignments/activities, and practical, carried out throughout the year in Achievement Standards and NZQA unit standards.
- External Assessment – assignments/activities, and practical, carried out throughout the year in Achievement Standards.

The Year 13 Materials Technology programme is assessed against Achievement Standards. Each has a credit weighting.
When you gain credit for an Achievement Standard/Unit Standard the credits contribute to your NCEA. You can also gain different grades for each Achievement Standard: ***Achieved, Achieved with Merit, Achieved with Excellence***. The grade you achieve is determined by the quality of your work as measured against national standards. ***It should be noted that Universities and Polytechnics are now requiring grades of Merit and Excellence for entry into many courses rather than simply credit totals.*** **Unit Standards** are simply either achieved or not achieved.

Parent / guardian signature:……phone……..
You will be informed by phone if I have any concerns about student progress.

OTUMOETAI COLLEGE

TECHNOLOGY LEVEL 3

INTRODUCTION

Welcome to the Year 13 Technology course. This is a one year, full-time course, which is designed to develop your competence and confidence in understanding and using existing technologies to create solutions to technological problems.

The course will develop your intellectual and practical skills by:

- Improving your technical knowledge and understanding of processes.
- Solving problems by working through the design process and making
- Understanding and being aware of the relationship between technology and society.

Technology is an internally and externally assessed National Certificate of Educational Achievement (NCEA) Level three subject. There are no exams. This means that all progress and performance is monitored and assessed by the teacher from the beginning of the year.

TECHNOLOGY MATRIX LEVEL 3

INTERNAL	EXTERNAL
3.1 AS90618 Develop and model a conceptual design to address a client issue in materials technology. *8credits* 3.2 AS90625 Develop a one-off solution to address a client issue in materials technology. *8 credits* 3.7 AS90687 Demonstrate advanced skills in materials in materials technology. *4 credits* *Unit standard US7526 L2 4 credits (use and care for portable machines in materials technology.)* *Unit standard US7530 L3 5 credits (Use, and care for, fixed machine tools in materials technology)* *Unit standard US7529 Test and select materials for a design task in materials technology. L3 5 credits*	3.6 AS90686 Demonstrate understanding of technological knowledge in materials technology. *4 credits*

AIMS OF MATERIALS TECHNOLOGY

The aim of this course is to present a course of study which requires students to express ideas in practical terms, by using selected materials and the processes of Materials by applying principles of good craftsmanship.

OBJECTIVES

- ◊ To encourage students to obtain a sense of achievement and satisfaction through success in craftsmanship and pride of workmanship.
- ◊ To gain experience in decision making through practical problem solving.
- ◊ To develop self discipline and a range of practical skills which permit the safe and satisfying use of equipment and materials.
- ◊ To practise the skills of reading, measurement, calculations, reasoning and experimentation in the workshop situation.
- ◊ To develop skills in searching for information and to present the findings.
- ◊ To make an honest appraisal of the quality of solutions in relation to original intentions.
- ◊ To work in depth with at least one material and to recognise and explore a variety of others.

To develop design skills that will allow the transition of knowledge and ideas into practical

OTUMOETAI COLLEGE PROGRAMME

PROJECT	ACHIEVEMENT STANDARD INTERNAL	ACHIEVEMENT STANDARD *EXTERNAL*
Product development design	3.1 AS90618 8cr, 3.2 AS90625 8cr and 3.7 AS90687 4cr	3.6 AS90686 4cr
Unit Standard 7526	**Level 2** 4 credits	
Unit Standard 7529	Level 3 5 credits	
Unit Standard 7530	Level 3 5 credits	
Total	**34**	**4**

It is important that ***you*** organise ***your*** work and time.

Your studies will be completed in the classroom, workshops and at home.

All written and practical work is marked. At the end of the year a Portfolio of your work will be sent away for the marking of the external standard. This ensures consistent grading throughout the whole country. For the internal Achievement Standards a sample of work from the whole school will be sent away for moderation purposes.

OTUMOETAI COLLEGE

TECHNOLOGY LEVEL 3

HOW TO PASS

➔ ARRIVE PROMPTLY TO CLASS.

➔ ATTEND SCHOOL ON A REGULAR BASIS.

➔ BE PREPARED FOR CLASS; I.E. BRING YOUR EQUIPMENT TO EVERY CLASS.

➔ WORK TO THE BEST OF YOUR ABILITY.

➔ MAKE ALL TIME COUNT.

➔ TAKE DIRECTION FROM YOUR TEACHER.

➔ DEVELOP AND USE A PLAN OF ACTION FOR EACH UNIT OF WORK TO ASSIST YOUR PLANNING AND PROGRESS.

➔ UNDERTAKE RESEARCH USING A WIDE VARIETY OF SOURCES.

➔ EVALUATE YOUR WORK AND YOUR PROGRESS REGULARLY BY UNDERTAKING YOUR OWN THINKING, DISCUSSING WITH YOUR FRIENDS, PARENTS AND TEACHER AND BY USING APPROPRIATE TESTING QUESTIONING.

COMPLETE ASSIGNMENTS ON TIME.

Achievement Standard

Subject Reference	Technology 3.1				
Title	Develop a conceptual design to address a client issue				
Level	3	**Credits**	8	**Assessment**	Internal
Subfield	Technology				
Domain	Technology – General Education				
Registration date	18 January 2006	**Date version published**	22 February 2006		

This achievement standard involves the use of project management tools to support brief development, modelling, testing and evaluation of a conceptual design that addresses a client issue.

Achievement Criteria

Achievement	**Achievement with Merit**	**Achievement with Excellence**
• Identify key factors and their implications in developing a brief that addresses a client issue.	• Identify and prioritise key factors, explaining their implications and interactions, in developing a brief that addresses a client issue.	• Identify and justify the prioritisation of key factors, explaining their implications and interactions, in developing a brief that addresses a client issue.
• Use project management tools to guide development work.	• Use project management tools to review and revise the development work.	• Use project management tools to review and revise the development work to pre-empt anticipated problems and/or overcome actual problems and/or maximise opportunities.
• Develop a conceptual design that addresses the requirements of the brief.	• Develop a conceptual design that addresses the requirements of the brief.	• Develop a conceptual design that addresses the requirements of the brief.
• Use modelling to evaluate and demonstrate to the client how the conceptual design is potentially fit for purpose.	• Use modelling to evaluate, and demonstrate to the client and other key stakeholders, how the conceptual design is potentially fit for purpose.	• Use modelling to evaluate, and demonstrate to the client, other key stakeholders and wider community stakeholders, how the conceptual design is potentially fit for purpose.

Explanatory Notes

1 This achievement standard is derived from *Technology in the New Zealand Curriculum*, Learning Media, Ministry of Education, 1995, Level 8; and *Hangarau i roto i te Marautanga o Aotearoa,* Te Pou Taki Kōrero, Te Tāhuhu o te Mātauranga, 1999.

2 Appropriate reference information is available in *Safety and Technology Education: A Guidance Manual for New Zealand Schools,* Learning Media, Ministry of Education, 1998; and the *Health and Safety Code of Practice for State Primary, Composite and Secondary Schools,* Learning Media, Ministry of Education, 1993.

3 *Key factors* are those that contribute both directly and indirectly to a specific technological practice and may include:

- client and other stakeholder factors such as beliefs, ethics, values, ability to access knowledge and skills, and social position
- broader factors such as legal, social, cultural, political, environmental and economic including consideration of global and future trends, and culture of technological innovation
- resource factors such as availability and accessibility of equipment, knowledge and skills.

4 Brief development entails:

- exploration and critical evaluation of a client issue to identify an authentic need or opportunity
- the development of an initial brief that identifies the constraints and opportunities on the conceptual design and the practice that can be undertaken to develop it. The initial brief should communicate the nature of the conceptual design(s) for the resolution or realisation of the identified need or opportunity
- identifying and accessing skills and knowledge that will be needed to refine the brief and fully investigate the identified opportunities and constraints with consideration of key and wider community stakeholder perspectives
- ongoing brief refinement and/or modification based on the student's developing understanding of the social and physical environment in which practice is undertaken, and in particular on feedback from key and wider community stakeholders. The student should develop an understanding of the need for the conceptual designs to be 'fit for purpose' in its broadest sense, and develop their brief in accordance with this
- development of a final brief that will provide specifications for the student, teacher, and key and wider community stakeholders and which includes a means of evaluating the conceptual design presented as being fit for purpose.

5 *Fit for purpose* is a term used to judge the ability of the conceptual design's potential to serve its purpose to 'do the job' within the intended location, where the 'job to be done' is clearly defined by the brief. Referring to potentially fit for purpose in its broadest sense within technology education, extends this usage to include the determination of the 'fitness' of the practices involved in the development of the conceptual design, as well as

the ‘fitness’ of the outcome, should the conceptual design be implemented. Exploration of relevant codes of practice, legal requirements, and understandings of ethical and cultural ways of practising, will therefore be important aspects of establishing potential fit for purpose. In demonstrating fit for purpose the student is expected to incorporate and evaluate feedback from relevant stakeholders.

6 A *client issue* is one that relates to a person or group. The client cannot be the student. However, if the client is representing a group, eg sports team manager, the student may be a non-leading member of this group, eg team member. The issue must generate a range of needs or opportunities for technological practice.

7 *Project management tools* are used to manage the overall technological development. This involves planning and effective communication between the student, client and other stakeholders.

The project management tools used will be dependent on the nature and the stage of the technological practice being undertaken. Tools could include such things as plans of action, Gantt charts, flow charts, block sequence diagrams, reflective journals, visual diaries, communication and management software.

8 A *conceptual design* describes an intended technological outcome (product, system or environment) and may be described using communicative tools such as 2D and 3D visual representations, written text, and oral communication.

9 *Modelling* a conceptual design involves the investigation and construction of a representation to explain, explore and evaluate the conceptual design idea against the specifications of the brief. Modelling can be used for ongoing trialing throughout the development of a conceptual design to test and evaluate aspects such as aesthetics, functionality, ergonomics and economic feasibility. Different models may need to be used to test different aspects. Modelling may use, but is not limited to, the following: two or three-dimensional physical models (full-sized or scaled) and computer simulations using a range of computer and audio-visual mediums.

10 *he client* is a key stakeholder. Other key stakeholders are those who are directly implicated in the development work, or would be directly impacted should the conceptual design be implemented. Wider-community stakeholders are those who are or may be indirectly implicated in the development work, or who would be impacted should the conceptual design be implemented.

Subject Reference	Technology 3.2				
Title	Develop a one-off solution to address a client issue				
Level	3	**Credits**	8	**Assessment**	Internal
Subfield	Technology				
Domain	Technology – General Education				
Registration date	18 January 2006	**Date version published**	22 February 2006		

This achievement standard involves the use of project management tools to support brief development, and the development, implementation and evaluation of a one-off solution that addresses a client issue.

Achievement Criteria

Achievement	**Achievement with Merit**	**Achievement with Excellence**
• Identify key factors and their implications in developing a brief that addresses a client issue.	• Identify and prioritise key factors, explaining their implications and interactions, in developing a brief that addresses a client issue.	• Identify and justify the prioritisation of key factors, explaining their implications and interactions, in developing a brief that addresses a client issue.
• Use project management tools to guide development work.	• Use project management tools to review and revise the development work.	• Use project management tools to review and revise the development work to pre-empt anticipated problems and/or overcome actual problems and/or maximise opportunities.
• Develop a one-off solution that addresses the requirements of the brief.	• Develop a one-off solution that addresses the requirements of the brief.	• Develop a one-off solution that addresses the requirements of the brief.

Achievement	Achievement with Merit	Achievement with Excellence
• Implement the one-off solution to evaluate and demonstrate to the client that it is fit for purpose.	• Implement the one-off solution to evaluate and demonstrate to the client, and any other key stakeholders that it is fit for purpose.	• Implement the one-off solution to evaluate and demonstrate to the client, and any other key and wider-community stakeholders, that it is fit for purpose, and to explore the viability of the solution.

Explanatory Notes

1 This achievement standard is derived from *Technology in the New Zealand Curriculum*, Learning Media, Ministry of Education, 1995, Level 8; and *Hangarau i roto i te Marautanga o Aotearoa,* Te Pou Taki Kōrero, Te Tāhuhu o te Mātauranga, 1999.

2 Appropriate reference information is available in *Safety and Technology Education: A Guidance Manual for New Zealand Schools*, Learning Media, Ministry of Education, 1998; and the *Health and Safety Code of Practice for State Primary, Composite and Secondary Schools,* Learning Media, Ministry of Education, 1993.

3 *Key factors* are those that contribute both directly and indirectly to a specific technological practice and may include:
- client and other stakeholder factors such as beliefs, ethics, values, ability to access knowledge and skills, and social position
- broader factors such as legal, social, cultural, political, environmental and economic including consideration of global and future trends, and culture of technological innovation
- resource factors such as availability and accessibility of equipment, knowledge and skills.

4 Brief development entails:
- exploration and critical evaluation of a client issue to identify an authentic need or opportunity
- the development of an initial brief that identifies the constraints and opportunities on the one-off solution and the practice that can be undertaken to develop it. The initial brief should communicate the nature of the one-off solution(s) for the resolution or realisation of the identified need or opportunity
- identifying and accessing skills and knowledge that will be needed to refine the brief and fully investigate the identified opportunities and constraints with consideration of key and wider community stakeholder perspectives

- ongoing brief refinement and/or modification based on the student's developing understanding of the social and physical environment in which practice is undertaken, and in particular on feedback from key and wider community stakeholders. The student should develop an understanding of the need for the one-off solution to be 'fit for purpose' in its broadest sense, and develop their brief in accordance with this
- development of a final brief that will provide specifications for the student, teacher, and key and wider community stakeholders and which includes a means of evaluating the one-off solution presented as being fit for purpose.

5 *Fit for purpose* is a term used to judge the ability of the one-off solution to serve its purpose to 'do the job' within the intended location, where the 'job to be done' is clearly defined by the brief. Referring to fit for purpose in its broadest sense within technology education extends this usage to include the determination of the 'fitness' of the practices involved in the development of the one-off solution, as well as the fitness of the one-off solution itself, for the identified purpose. Exploration of relevant codes of practice, legal requirements and understandings of ethical and cultural ways of practising, will therefore be important aspects of establishing fit for purpose**.** In demonstrating fit for purpose the student is expected to incorporate and evaluate feedback from relevant stakeholders.

6 A *client issue* is one that relates to a person or group. The client cannot be the student. However, if the client is representing a group, eg sports team manager, the student may be a non-leading member of this group, eg team member. The issue must generate a range of needs or opportunities for technological practice.

1 *Project management tools* are used to manage the overall technological development. This involves planning and effective communication between the student, client and other stakeholders.

The project management tools used will be dependent on the nature and the stage of the technological practice being undertaken. Tools could include such things as plans of action, Gantt charts, flow charts, block sequence diagrams, reflective journals, visual diaries, communication and management software.

2 *A one-off solution* is a technological outcome that is developed to meet the need or realise the opportunity as defined in the brief. Implementation of a one-off solution should be evaluated in terms of its fitness for purpose in addressing the identified client issue.

3 *The client* is a key stakeholder. Other key stakeholders are those who are directly implicated in the development work, or would be directly impacted by the implementation of the one-off solution. Wider-community stakeholders are those who are or may be indirectly implicated in the development work, or would be impacted by the implementation of the one-off solution.

4 *Viability* refers to such things as the sustainability of the one-off solution for the estimated life cycle in terms of the potential social and environmental impact, likely future demand, and the availability of resources for maintenance and disposal.

Subject Reference	Materials Technology 3.6				
Title	Explain knowledge that underpins a materials technology outcome				
Level	3	**Credits**	4	**Assessment**	External
Subfield	Technology				
Domain	Technology – General Education				
Registration date	18 January 2006	**Date version published**	22 February 2006		

This achievement standard involves explaining knowledge that underpins the development of an existing materials technology outcome.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
• Explain the knowledge that underpins the development of an existing materials technology outcome.	• Explain the underpinning knowledge and how it has been synthesised in the development of an existing materials technology outcome.	• Discuss the underpinning knowledge and how it has been synthesised in the development of two or more existing materials technology outcomes.

Explanatory Notes

1 This achievement standard is derived from *Technology in the New Zealand Curriculum*, Learning Media, Ministry of Education, 1995, Level 8; and *Hangarau i roto i te Marautanga o Aotearoa,* Te Pou Taki Kōrero, Te Tāhuhu o te Mātauranga, 1999.

2 Appropriate reference information is available in *Safety and Technology Education: A Guidance Manual for New Zealand Schools,* Learning Media, Ministry of Education, 1998; and the *Health and Safety Code of Practice for State Primary, Composite and Secondary Schools,* Learning Media, Ministry of Education, 1993.

3 *An existing materials technology outcome* is one that has been developed and implemented by a technologist(s). A *technologist* is defined as a professional involved in the design and/or development of a technological outcome. The student cannot be the technologist.

4 *Knowledge* that underpins the development of an existing materials technology outcome includes such things as:

- knowledge of the key resources (including such things as people, time, components, and materials) that have been used
- knowledge of codes of practice, codes of ethics, and legislation
- knowledge from other disciplines, eg science, social science, arts
- techniques and procedures used to develop and implement the technological outcome.

5 *Explain* means describe in detail giving reasons.
Discuss means compare and contrast.
Synthesise refers to the ability to bring together knowledge, skills, ideas and methods from different sources to advance one's practice but not necessarily to produce a more complex outcome. This emphasis is about knowledge and the way it is used, not the quality of the outcome. Therefore, for achievement with merit or achievement with excellence, the student is able to demonstrate access to a wide variety of knowledge and the discerning use of knowledge relevant to the existing technological outcome.

Subject Reference		Materials Technology 3.7			
Title		Demonstrate techniques in materials technology			
Level	3	**Credits**	4	**Assessment**	Internal
Subfield	Technology				
Domain	Technology – General Education				
Registration date	18 January 2006	**Date version published**		22 February 2006	

This achievement standard involves demonstrating techniques when developing a materials technology outcome(s).

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
• Demonstrate techniques when developing a materials technology outcome(s).	• Demonstrate complex techniques when developing a materials technology outcome(s).	• Demonstrate a combination of complex techniques that lead to a high quality materials technology outcome(s).

Explanatory Notes

1 This achievement standard is derived from *Technology in the New Zealand Curriculum*, Learning Media, Ministry of Education, 1995, Level 8; and *Hangarau i roto i te Marautanga o Aotearoa,* Te Pou Taki Kōrero, Te Tāhuhu o te Mātauranga, 1999.

2 Appropriate reference information is available in *Safety and Technology Education: A Guidance Manual for New Zealand Schools,* Learning Media, Ministry of Education, 1998; and the *Health and Safety Code of Practice for State Primary, Composite and Secondary Schools,* Learning Media, Ministry of Education, 1993.

3 *Techniques* in materials technology refer to things such as:
- transformation of materials
- manipulation of materials
- modification of materials
- transformation skills: eg joining or laminating materials to develop different performance properties such as in the use of layering textiles (interfacings, interlinings and linings) in tailoring; or the lamination of timbers to produce compound curves; or the use of fibre reinforced plastics to improve strength and stability of resins
- manipulation skills: eg cutting, machining and assembly of component parts within specified tolerances, drafting and/or adaptation of patterns in the

interpretation of original designs to enable assembly of the component parts; managing to shape and structure textiles in garment construction; incorporating difficult-to-handle materials successfully into products, eg textiles such as sheers, velvets into a garment, joining and machining of stainless steel, cutting and assembly of compound mitre joints

- modification skills to change a material's:
  - form, eg from flat sheet to corrugated, woollen yarn into felt
  - properties, eg hardness, physical state, brittleness, colour, density, malleability, ductility, surface texture; use of embellishment techniques, changing wool fibre into fire resistance woollen insulation materials.

5 *Technique* refers to a combination of skills carried out in a particular order for a particular purpose. The selection of techniques is context specific. *Complex techniques* require a combination of techniques carried out in a particular order for a particular purpose.

5 A *high quality materials technology outcome* is one that is fully fit for purpose, and in addition displays attributes that show a combination of complex techniques have been implemented successfully. 'Fit for purpose' is a term used to judge the ability of the materials technology outcome to serve its purpose to 'do the job' within the intended location, where the 'job to be done' is clearly defined by the brief. Referring to 'fit for purpose' in its broadest sense within technology education, extends this usage to include the determination of the fitness of the practices involved in the development of the materials technology outcome, as well as the fitness of the materials technology outcome itself, for the identified purpose. Exploration of relevant codes of practice, legal requirements and understandings of ethical and cultural ways of practising, will therefore be important aspects of establishing 'fit for purpose'. In demonstrating 'fit for purpose' the student is expected to incorporate and evaluate feedback from relevant stakeholders.

6 Techniques in materials technology may be demonstrated in the production of models, prototypes, one-off solutions or products from multi-unit production.

7 Techniques performed need to be performed in keeping with relevant codes of practice that include:

- legal responsibilities including:
  - Acts (eg Fair Trading Act 1986, Consumer Guarantees Act 1993, Health and Safety in Employment Act 1992, Privacy Act 1993, Employment Relations Act 2000, Resource Management Act 1991, Hazardous Substances and New Organisms Act 1996)
  - Standards (eg ISO standards – 9000, 14000 series, Standards New Zealand (SNZ) standards)
- ethical responsibilities including:
  - professional (eg stipulated by codes of ethics developed by professional associations)
  - cultural and/or religious (eg in keeping with the accepted practices of cultures and religions)
- moral responsibilities driven by the beliefs and values of the technologist.

COURSE COMPLETION

At the completion of the course each student will have two folios of design and written work, the completed practical work associated with them, a design brief portfolio, and a case study portfolio.

Policy: The two factors involved in satisfactory completion of this qualification are:

(a) Satisfactory attendance.
(b) Fulfilment of course requirements.

Candidates who fail to comply with ***either*** of these factors will have their qualification entry cancelled.

DEADLINES

Deadline dates for assignments are ***NOT*** normally negotiable – except under mitigating circumstances. If you have personal problems that prevent you meeting deadlines or attending regularly and punctually, please speak to me at the ***earliest opportunity***.

When an assignment has been set it must be submitted on or before the due date. The start of the nominated period on the due date is the deadline.

Any student who envisages being unable to complete an assignment on time through circumstances beyond their control should request an extension from the teacher.

"Extension Application" must be made on an official application form at least three school days before the due deadline. At the time of request, work done to date must be displayed along with a signed explanation for the request from a parent/guardian. Failure to submit a satisfactory effort will result in no extension being granted. Any extension will not normally exceed three days beyond the original deadline.

A student who chooses not to do a piece of work and gets 0 score will be warned of the minimum course requirements.

HEALTH AND SAFETY

Otumoetai College has a Health and Safety Policy in accordance with the Health and Safety in Schools Code of Practice 1993. Students shall adhere to the workshop safety rules.

A workshop environment can be dangerous, you must take reasonable care so as not to endanger yourself and others. You must act in a responsible manner at all times. The school will supply **safety equipment** which is provided for your health and safety, this **MUST be worn** when working with machinery and equipment in the workshop – do not misuse the equipment or attempt to use machinery on which you have not been instructed.

And finally …

Remember that your teacher is here to help you through the course and provide you with the opportunity for success. If you have any difficulties, then please tell the teacher at the ***earliest*** opportunity so that they can resolve the problem.

You have made the initial move in choosing this course as an important step in your career. We want this to be a happy and successful year for you. We trust that you will be able to look back and see it as the starting point for a successful career.

LIST OF COURSE REQUIREMENTS

You will be required to provide the following equipment:

- A4 writing and A3drawing paper
- An A3 size drawing folder or an A3 ring-binder with clear plastic pockets
- Calculator
- Drawing equipment
- Choice of blue/black/red pens
- Good quality marker pens, coloured pencils, notebook/pad
- A memory stick would be an advantage
- Dark chocolate for attempts at bribing the teacher

Terms & Jargon

A Culture of Technological Innovation: *This can be addressed by looking at how innovation occurs or exercises in creativity [thinking outside the square!]. Much of this term relates to how technologies influence society and/or how society influences technological outcomes. Remember that after an initial* ***eureka*** *there is always a process of development i.e. as in the internal standards.*
Brief: *Made up of a conceptual statement [c.f.] and a set of specifications [c.f.].*
Conceptual Statement: *Sentence or sentences that describe the desired outcome and its relationship to the need or opportunity i.e. What we are doing and why we are doing it?*
Cultural Factors: *Tikanga Maori, Treaty of Waitangi, NESB, appropriate language/symbols [c.f. technology transfer].*
Develop: *This term implies that the component of practice is created in an ongoing way and is a part of a student's technological practice. There must be evidence of revision, refinement and addition of the practice that is backed up with the* ***'why'*** *they took place.*
Economic factors: *these will relate to a stakeholder's ability to afford the solution or a consideration of what are appropriate materials, there is also a relationship to 1.4 which considers production and process.*
Environmental factors: *a consideration of the environment in which the solution will exist e.g. how the product will be disposed of when it is finished?*
Implications: *These show the connections between say key factors and the stakeholders of the issue i.e. safety is a key factor in this issue because …*
Key factors: *Important parts of the issue.*
Knowledge bases: *these are sometimes called knowledge domains e.g. chemistry, engineering, nutrition, mathematics. Students should recognise that they will need to access and use in practice a range of knowledge. They will need to have a method of gathering and then screening knowledge to use in the development of an outcome.*
Legal factors: *any specification that has a legal basis e.g. distance between bars on a cot, baby walkers, use on the road.*
Political factors: *this is how government (local & national) policy and agenda impact on solution development e.g. possible embargo on GE products.*
Social factors: *trends, current events, fashions, peer groups e.g. the use of cell phones by teenagers.*
Solution / Outcome: *These are often used as interchangeable terms. Both identify the result of undertaking technological practice.*
Specifications: *These are both the desirable attributes and the constraints [see tech. practice handout].*
Stakeholder beliefs, ethics, and values: *these will colour a stakeholder's understanding of; a need/opportunity, the most important attributes of an outcome, how it will used by them and others. These influences will depend on all the aspects of the stakeholder's background – culture, knowledge, skills, position in life etc. Students should show understanding of these influences.*
Stakeholders: *These are all the people/groups that will affect and be affected by the solution. They must be prioritised with the user (user group) at the top.*
User (group): This is the primary stakeholder. This person or group will have the most influence over the development of the solution.

PROJECT PLANNING

A plan of action and how this has guided you in developing your technological solution (Students under the direction and guidance of the teacher discuss what a plan of action means to them.)

Before embarking on any project to do it successfully one has to plan ahead.

This planning may take the form of a list of things to do and think about before developing a technological solution.

Headings that might prove to be useful are:

- Time and dates
- Deadlines
- Resources needed
- Skills required
- Where help may be obtained
- Cost
- What research is needed
- Personal comments
- Key Milestones (key decisions)
- Stakeholder consultation
- What needs to be done
- How you will do it
- Safety
- Quality control checks
- Modifications and justifications

This list is a guide and the method you use to develop your own plan of action is a personal choice.

It is important that you think ahead in order to utilise every available minute during class time and to be confident that you have considered all possibilities to ensure the success of making your project.

Your plan of action will guide you in your making but as you progress you may find that your plan needs altering or you may find you will have to follow a different path due to different circumstances or unperceived problems.

Through out the process of putting your plan of action into action you will need to document each stage in order to provide hard evidence. In your portfolio follow the design process: investigation, initial ideas, design development, final idea, working drawing, and evaluate through out. Document the changes you have made, the problems you have encountered, how you have solved problems, new developments. Justify your decisions and keep your portfolio alongside you in class and take time to write up your thoughts on a regular basis. This could be like a running commentary or a diary. Use the digital camera to remind you of the different stages you go through/or purchase a **disposable camera**. Keep all experiments and failures say how you have developed form them. Again your portfolio is a personal record and therefore you decide how you are going to record your development and present it.

TECHNOLOGICAL PROCESS

- ☆ Issue – Context – Teacher directed
- ☆ Needs & opportunities
- ☆ Identify Key Factors
  - Society – Effects on Society
  - Stakeholders
  - Form, function etc
- ☆ Consider interaction between key factors
- ☆ Research conceptual knowledge – safety
- ☆ Consult stakeholders
- ☆ Write brief
- ☆ Consult stakeholders
- ☆ Write specifications
- ☆ Consult stakeholders
- ☆ Concepts
- ☆ Consult stakeholders
- ☆ Development
- ☆ Consult stakeholders
- ☆ Final design
- ☆ Consult stakeholders
- ☆ Model solution – procedural knowledge safety
- ☆ Consult stakeholders
- ☆ Evaluation and testing against essential requirements of the brief

Key resources may include such things as practicing technologists, process/production workers, materials/components, machines/tools, techniques used to manipulate materials/components.

Key materials may include those that:

- are used to develop a technological outcome (e.g. materials used within mockups, models and/or prototypes);
- enable the manufacture and/or are included in a technological outcome.

Key components may include those existing technologies that are:

- used to develop a technological outcome (e.g. dressmakers forms used to toile a garment, equipment used to test a mockups or prototype's fitness for purpose);
- included in a technological outcome for example: electrical components (e.g. resistors, capacitors etc.), fasteners (e.g. zippers, bolts, velcro, etc.), ingredients (e.g. flour, sugar).

Key techniques include those that are used to develop a technological outcome. For example techniques such as those used for measuring, processing, finishing, communicating, testing and evaluating.

Technological principles include those such as:

- **Fitness for purpose**
- **Reliability**
- **Optimisation**
- **Ergonomics**
- **Efficiency**
- **Aesthetics**