Year 9 Middle School HANDBOOK 2024

## Welcome to the Middle School

The Middle School not only represents a physical change of location for students, but the program offered is different from that in the Junior School, and reflects the fact that students are now older and are ready to explore different options.

Some of the major changes in the operation of the Middle School, compared to the Junior School, are:

1. In Years 7 and 8, all students experience a broad general education so that they can gauge their strengths and weaknesses, and areas that interest them. In the Middle School, there are some compulsory areas of study, but more choice is available. Essentially though, students are still undertaking a general education.
2. In Years 7 and 8 , most studies are taught to students as a Form Group. In the Middle School, there are no Form Groups. Students will be in classes that will include other students who have selected that particular unit of study. Students study six units each semester - each class will be made up of different students.
3. Middle School students are beginning to plan for their futures. The level of work is increased, and students need to accept that homework and study at home will increase, so that they can keep up with the work requirements for each subject.
4. There is a group of coordinators who look after the welfare and needs of the Middle School students. The Middle School team is shown below on this page.
5. There is close co-operation between the Mini Schools regarding student records and information, but for many students, the Middle School offers a real opportunity for a fresh start to their Secondary Education.

This handbook outlines the program options at Year 9 and should be read carefully. If you have any questions, please do not hesitate to contact the College on telephone: 51279246 (Middle School).

## Table of Contents

Welcome to Middle School ............ 2
The Year 9 Program ...................... 3
Choosing Your Subjects ................ 4
English.......................................... 5
Mathematics .................................. 6
Humanities..................................... 7
Science......................................... 8
Health/PE ...................................... 9
Music ............................................ 11
Languages................................... 13
Technology -Food........................ 14
Technology - Materials................. 16
Art................................................. 17

Middle School Co-ordination Team


Darren Mitchell Middle School Leader


Andrea Coad
Administrative Assistant


Jason Sands Year 9 Coordinator


Daniel Board Year 9 Coordinator


Harry Pepper Student Support Officer Year 10 Coordinator


Julie Sheahey Year 10 Coordinator

For each Key Learning Area, this means:

## English

English is a compulsory subject and students will study English in both semesters.

## Mathematics

Like English, students will study Mathematics in both semesters.

## Science

Students will study two core units of Science - one in each semester. Students can also choose to do additional electives.

## Health/PE

Students will study a compulsory Health/PE unit. Boys and girls are in separate classes. Students can elect to undertake more units in this area as well.

## Arts \& Technology

These areas are not compulsory, however you are advised to take at least one unit of each to give you a broad program.

## Humanities

Students will study a core Humanities unit of study. They can also elect to study more units in each Key Learning Area if they wish to.

## Languages/LOTE

Students can elect to continue their studies in languages, in either Italian or Indonesian if they wish to, or have the option to begin a class in Chinese.


Please read the following pieces of advice to guide you in choosing your Year 9 Program.

The best advice when choosing a course for Year 9 is to look at a balanced program that best reflects your skills, abilities, and interest levels. It is a chance to have a go at some electives so that when you enter the Senior School, you have a better idea of where you would like to head in your future career.

1. Do not rush the process. We have timelines for you to meet, but these are important choices for you to make, so choose carefully.
2. This is your program, not your friends. Choose the best options for you. You are the one who has to study each elective at least three periods a week for a semester.
3. Do not be influenced by what students tell you about an elective. Find out for yourself. Ask your current teacher to explain an elective, or seek the teacher listed as the contact for more information.
4. Some electives involve additional costs. These are listed in the handbook. Take these into consideration when making final decisions.
5. Do not choose electives because of the name or title. Once again, find out as much as you can about each elective that interests you. Speak to the staff involved.
6. Do not choose a unit because of who you think the teacher will be. Staffing has not been finalised, so we do not know at this point who will be teaching which electives.
7. In the handbook, there are pathways shown that indicate to you where studying each elective may take you in your future studies. These are guides to consider.
8. Students will meet with a Middle School coordinator to finalise their selection.
9. In 2016, Lowanna College introduced the Lowanna Sports Academy (Formally known as SEP). There is some information in this handbook and students interested will receive more information later.

## The Process in Selecting a Course

1. Read this handbook so you are aware of the options and choices available.
2. Hint: As you read the handbook, place a line through those units you definitely would not consider. Keep the rest open at this stage. This will make it easier for you to refer back to the handbook when making your final selections.
3. Seek advice from the teachers listed as a contact to gain more information about electives you are interested in.
4. Speak to one of the Middle School coordinators if you are having trouble understanding the process, or if you have some questions.
5. Complete the Subject Selection Sheet listing your preferences. The sheet is designed to assist you in making the correct choices. When you reach your free choices (Numbers 9-12), list them in order of preference.
6. Please also list additional choices (Numbers 13-15) of electives that you would be prepared to include if one or more of your initial choices is unavailable. Do these in order.
7. You will be advised later if for some reason there is an issue with your course.
8. Please be involved. This is important. We are here to help you make the best selections. Good luck.


Students must complete two semester units of English in Year 9

## English

English is designed to meet the needs of the majority of students in Middle School. These units focus on a range of texts and involve students in extending their language and communication skills through developing their abilities in reading, writing, listening and speaking.


## Pathway Options



## Mathematics

## The Mathematics Strands

The Mathematics strands are: Number \& Algebra; Measurement and Geometry; and Statistics \& Probability', as per the Victorian Curriculum.

## General information

Students must complete two semesters of Maths in Year 9.

## Year 9 Mathematics

Year 9 Mathematics curriculum at Lowanna will expand and build upon students' previous knowledge as they begin to explore more complex mathematical concepts across the Victorian Curriculum strands: 'Number and Algebra', 'Measurement and Geometry', and 'Statistics and Probability'. Classes are organised to enable teachers to readily meet the learning needs of their students and target the instruction of their lessons accordingly. This design will prepare students with mathematical skills for their future as they move into either academic or vocational pathways.


## Mathematics Pathways

The flow diagram below shows the possible pathways available to students in their choice of Mathematics.

- The solid vertical arrows indicate the sequence and direction normally taken.
- The solid diagonal arrows offer a possible alternative pathway for students in Mathematics.
- The dashed arrows indicate a possible sequence which requires extra preparatory work and must be approved by the Numeracy Specialist in conjunction with the current Mathematics teacher.



## Humanities

## Core Humanities

In Year 9, all students will be required to complete a compulsory year of Humanities. This unit is made up of a History, Geography, Economics and Civics course as outlined in the Victorian Curriculum.
The History section is about the Making of the Modern World, which includes Australia's history from 1750 to 1918, the Geography section is about themes of interconnection relating to Australia and the World. Economics is a focus on consumer and financial literacy and work as well as work futures. For civics, students look at Australia's system of government and key principles of Australia's legal justice system.

## Humanities Electives

In addition to the above requirements, students can also choose to do additional electives from any one of the following subjects:

## History Unit

## Australian Studies

In this unit students will have the opportunity to look at Australia through a different lens. This will include area of History not presently taught in their core Hums, along with areas of Geography that may inform us of our development as a nation.Students will learn about:

- Indigenous history including preEuropean colonisation
- Bushrangers and the Gold Rushes
- Exploration and Expansion
- Australia at war
- Daily life throughout the 20th century
- The formation of our country, and megafauna
- Tourism


## Geography Unit

## The Environment Under Threat

This unit will introduce students to how the world will be affected if we do not make changes soon whether personally, corporately, or governmentally.

Topics will include climate change, energy "crisis", failing food systems and soil degradation, just to name a few. We will look at the causes and solutions to climate change and how it not only affects the planet but humanity.

## History Unit

## History Through Film

In this unit students will have the opportunity to explore the different perspectives of history through an exploration of film texts. A range of carefully selected movies will be used to introduce, explore, and trigger the curiosity of students to several events throughout the Modern History period. Students will then research these events to better understand their causes and effects on that time and their legacy today.

## Humanities Pathways

## Middle School Subjects


tory 1 \& 2

- Geography 1 \& 2

VCE Level 3 \& 4 Units

- History Revolutions 3 \& 4
- Australian History 3 \& 4
- Geography 3 \& 4
- History Revolutions 3 \& 4
- Australian History 3 \& 4

[^0]Students are to do a minimum of two Core Science subjects - one each semester. Students may also select any of the additional electives.

## Core Science

## General Science

This unit covers the following topics:

- Chemistry - Matter
- Nerves and Hormones
- Ecosystems
- Chemistry - Chemical Reations
- Energy
- Earth Science


## Science Electives

## Forensic Science

This unit introduces students to the science of criminal investigation and is a hands-on subject applying scientific method to the real world. It develops skills in scientific methods and analysis used in obtaining evidence to prosecute criminals. Areas covered include trace evidence, fingerprints, blood, DNA, forensic anthropology and criminal profiling

## Introduction to Psychology

Psychology is the scientific study of behaviour and the mind. Students will be introduced to what Psychology is, how it is studied and a number of the different types of Psychology. They will learn about sports, clinical, forensic and educational Psychology. Psychology is a subject that will explain why you behave the way that you do and why others behave the way that they do.


## Agriculture Studies

Students firstly learn about the major Agriculture Industries in Australia. They include:

- Dairy
- Beef
- Poultry
- Horticulture

This course has a large practical component, including the 'Cows Create Careers' project where students are required to raise dairy calves and research the Dairy Industry. Other projects include growing vegetables.

During the semester, the course covers a range of topics, such as:

- Weather and climate
- Agricultural areas of Australia
- Soil nutrients and soil types
- Comparison of the nutrients and methods in the production of grass, hay and silage
- Sustainable Farming
- Anatomy and Physiology of plants and animals.
- Animal and fowl diseases and the common methods of control
This unit is designed to give a broad overview of Agriculture and Horticulture in Australia with the intention of exposing students to areas of study they may wish to pursue into VCE, for example, Units 1-4 VCE Agricultural and Horticultural Studies.


All Year 9 students are expected to study the General Physical Education and Health all year. Students have the option to choose electives from below.

## General Physical Education

Practical Physical Education units to be covered will be fitness and a variety of set sports.
Health Education topics to be studied include:

- Drug Education
- Sexuality/Relationships
- Safety
- Nutrition


## Physical \& Health Education Electives

## Outdoor and Environmental Recreation

Students participate in a variety of school based activities which include team building, trust and initiative activities. This unique program at Lowanna College offers a broad range of recreational pursuits which may include a selection of the following activities:


- Trampolining
- Knots \& indoor rock climbing
- Navigation
- Bike education and road safety
- Camp cookery
- Preventing injuries and administering basic first aid

Activities involve an additional cost, totalling approximately $\$ 100$ for the semester. Practical activities are compulsory.

This subject is the preferred stepping stone towards Year 10 Outdoor and Environmental Education, and then VCE Outdoor and Environmental Studies Units 1-4.

## Lowanna Sports Academy

Lowanna College is offering students to be a part of the Sports Academy. This is a fully integrated academic and sporting program for students specialising in the sports of AFL Boys, Basketball, AFL Girls, Netball and Soccer. At years 9 and 10, the classes are split into boys and girls only classes. The program will be conducted by Mr Chandler, Mr Santo, Mr Swinley, Mr Bailey and Mrs Gardiner.

Program aims:

- To provide diverse sporting and career pathways for students involved in the SEP to meet their needs and develop their potential.
- Students who want to optimise their education with a balance of sport and academics.
- To develop strong partnerships with peak sporting organisations and related sports industries.
- To promote a "culture of excellence" with focus on academic, personal and sporting development.

Some of the topics covered include: Individual/team skill coaching, fitness testing, skill \& game analysis, game strategies, individual skill practice and development, individualised strength and conditioning, coaching and umpiring, sports injuries and rehabilitation, nutrition for sports performance and recovery and fitness training methods.
They Year 9 theoretical part of the program aims to increase the prior knowledge for both VCE PE and VET Sport and Recreation Certificate III.
This program will incur a fee $\$ 399$.
Due to the complexity of the timetable and the selection process, interested students and families are encouraged to seek further information from Mr Chandler.

## Health \& Physical Education



Pathways for Health \& Physical Education


Music in the Middle School should be viewed as a 4 unit course of study over two years, however there are prerequisites for entry into this study at any level (except for VCE Unit 3 \& 4).
This course covers Music Industry Skills, Class Band, Composing, Recording and Performing.
Students interested in developing skills and knowledge about music performance, song writing and industry skills can elect to pursue a course of study that is designed to sequentially build knowledge and understanding. The classes are based on themes with all performance content related to the theme; concerts are presented to the school and wider community. Students will be expected to develop musical literacy and numeracy and demonstrate a capacity to critically and creatively respond to a range of musical styles.
Students will study music appreciation, analysis of styles and genres, theory, composition, technical production and performance culminating in school based performance.

Composition is in the form of song writing where students have the opportunity to compose, arrange and record their work as part of the Kool Skools recording project. Kool Skools promotes, develops and supports a diverse range of talent and all genres of contemporary music writing and performance. Students are given the opportunity to work in a professional studio in Melbourne, recording their own material. Student will produce the artwork, photography, video and all the music as part of the project. Those who don't get to be a part of Kool Skools can still experience recording here at school.
This course will provide students with an entry to VET Music Technical Production, VET Music Performance or VCE Music Performance.
Year 9 and 10 students will complete Work Units in the following areas;
Song writing - students will learn how to manipulate musical elements and create a song of their own. Every music student from Year 9 to Year 12 has the option of auditioning to be a part of Kool Skools.

Kool Skools - students who have successfully auditioned their songs can be included in Kool Skools recording. Studio 52 in Melbourne provides students with the opportunity to record their works onto a professionally produced CD.
Class Band Ensemble - each year students from Year 9 - Year 12 prepare a selection of works based on a theme and present them in concert towards the end of semester 2.
Music Prac - students will be encouraged to form small groups within class and prepare a range of music including covers of popular songs and their own compositions.
Theory and Composition - students will develop knowledge and understanding of theory and creative organisation of sound.
Music Industry - students will explore selected areas of the Music Industry including; stage set up, basic PA operation, set up and operation of lighting rig, basic management skills.

## Pathways for Music

The completion of any of the selected VCE subjects lead on to the University and Job list below.


VCE Year 11 Music Performance

VCE Year 12 Music Performance

VCE Year 11 VET Music Performance

VCE Year 12 VET
Music Performance

VCE Year 11 VET Technical Production

VCE Year 12 VET Technical Production

## Music Excellence Program

The Lowanna Music Department in 2020 will be offering students an opportunity to complete an intensive Music Excellence Program. This program will cover performance, composition, music technology and theory and allow students to develop skills in solo and group performance settings.
Students studying the MEP program will have the option of completing a range of musical performance and theory exams such as AMEB as well as completing modules from Certificate II in Music through COSAMP.
Note; Students will be performing in both a solo and group setting.
The Solo component is designed to provide students with the opportunity to develop performance skills whilst performing solo. Solo students will need to prepare and present in a formal performance at least 2 solo pieces per semester and will be in a formal concert setting to be decided on by the music department staff.

The Group component is designed to provide students with the opportunity to develop performance skills whilst working in a group. Group students will be required to prepare and present at least 4 pieces per semester and this will be in a formal school concert setting.

Students who wish to be a part of the MEP must present for a short audition and interview with the music department staff.
The course is set out with four outcomes:

## Outcome 1 - Performance

- Solo Performance and Group


## Performance

Outcome 2 - Performance Techniques
Outcome 3 - Theory, Aural and Analysis
Outcome 4 - Composition and Music Technology
MEP students will complete modules from Certificate II in Music Performance and this will be a pathway to VCE VET Music in Year 11 and 12.

## Cost

A fee of $\$ 300$ will apply to students participating in the MEP program. It is planned that the students will have an excursion or incursion once a term and the fee will cover the basic costs incurred.

There is an expectation that students will have instrumental lessons as part of the extension program for MEP and part of the cost will cover sundry items required for this aspect of the course.

## Year 9 \& 10 Music Performance and Composition

This should be viewed a two year subject; Year 9= Year 1 and Year 10= Year 2 and is focused on a general music access model.

This subject is designed to allow students to develope their musical appreciation skills, instrumental skills, composition and music technology skills.

Students will develop skill in basic music theory and performance as well as exploring music technology through composing with softwarem basic PA operation and recording and lighting operations.
Students will be expected to participate in class band and learn instrumental techniques required to present a range of selected songs in a range of styles and performance students can choose their own instrument to play in class band. All students will be expected to perform in end of semester and end of year concerts and soirees.
Students will explore music creativity through composition demonstrating understanding of theoretical and stylistic characteristics of selected styles. All original composition will be performed on instruments or using software.

Students will be able to record their compositions, class band or small group using the recording facilities at the College.

There is no pre-requisite for the study as it's aim is a general overview which will prepare students for further study in VCE or VET Music.

Knowledge of a foreign language can open doors to a wide range of employment opportunities in areas of business, teaching, government, tourism, travel, hospitality, translating and interpreting, automotive, medicine, engineering and journalism.

Whatever, level of competence is attained, there are benefits to be gained from learning a language, such as:

- Enhancing literacy skills of ALL learners
- Building confidence
- Encouraging cultural awareness, tolerance and understanding
- Teaching students to be thinkers and problem-solvers
- Enhancing future job opportunities as well as expanding life opportunities and experiences

Lowanna College offers two languages through to VCE: Italian and Indonesian
Students may choose to study a Language as a prerequisite for VCE Language studies or they may simply enjoy their study of Languages in Year 9 and/or Year 10. A benefit of selecting a Language in VCE is that it adds bonus points to their ATAR score (see your Language teacher and careers adviser for more information). Students studying a language have the opportunity to participate in excursions, locally and in the metropolitan area, exchanges and overseas trips.
Students who have demonstrated their skills in a language and/or are interested in continuing their Language studies should discuss their options with their Language teacher.

## Pathways to VCE

Students in Year 8 are encouraged to continue their studies in languages as a year 9 student. Students in Year 8 who wish to continue their studies to VCE should choose Italian or Indonesian in their year 9 program. In Year 9, Language units must be selected for both semesters. Please read the information and description for each unit before making your selection.


Students who have demonstrated their skills in language study and/or are interested in continuing their Language studies should discuss their options with their language teachers and careers advisor.

## Year 9 Italian

Students will study aspects of the Italian language and culture. Emphasis will be placed on developing students' writing, reading, listening and speaking skills in Italian. More emphasis will be placed on grammatical concepts and communicative tasks in the language. Students will have the opportunity to participate in the Dante Alighieri Poetry Competition in Melbourne.

Please note that Year 8 Italian is a prerequisite for this unit.

## Year 9 Indonesian

Students will study aspects of the Indonesian language and culture. Emphasis will be placed on developing their writing, reading, listening and speaking skills in Indonesian. More emphasis will be placed on grammatical concepts and communicative tasks in this language. Students will have the opportunity to participate in excursions.

Please note that Year 8 Indonesian is a prerequisite for this unit.


## Technology - Food

At least one unit per year of any Technology unit is compulsory in your Middle School course for year 9.
All Technology units require students to complete and satisfactorily pass 3 learning tasks, research tasks, design folios and evaluation activities.

## Yr 9 Food \& Health

This unit includes both practical and theoretical components.

Student will develop their knowledge and skills by learning how to use current healthy eating models to research and design nutritionally balanced meal solutions that incorporate healthy cooking processes and ingredients. They will prepare a range of dishes suitable for breakfast, lunch, dinner and snacks.

Students will also study how to adapt meals for special dietary needs. A range of common assessment tasks will be used for students to complete for assessment of this unit.


Pathways for Food Technology


## Technology - Food

## Do you enjoy or are you good at Food Studies?



## Training levels and requirements

## Level 1

mint

 eflmadititeran

## Lemela





## Levis 1






## Levil 4


 Intotaing ata infortict






Fint foter ntornima vire www.mytutureedu.au

## Yr 9 Technology Automotive

This unit is designed to teach students on the differing operational principles of the internal combustion engine, including the two and four stroke engines. They will develop an understanding of the specific systems required in their operation. Students will develop skills using industry specific tools and equipment. Students will study individual systems taking into account their applications within an internal combustion engine plant. They will learn relevant safety and maintenance procedures associated with the subject matter.

## Yr 9 Technology Woodwork

Students will be introduced to a variety of processes, techniques and equipment to produce a project made primarily of timber. The students will be encouraged to work as individuals and to co-operate in team situations. $\mathrm{OH} \& \mathrm{~S}$ relating to workshop safety will be observed at all times and students will be constantly monitored. Students will be required to maintain a design folio which will contain design techniques, research assignments, evaluation techniques and the maintenance of a diary. Strong emphasis on electronic media will be encouraged to complete sections of the design folio.

## Yr 9 Technology Metalwork

In this unit, students will learn and use a variety of processes and equipment to make projects to progress students through the skills and knowledge of materials and processes. Students will work individually and in teams to create systematic approaches for generating design options. Students must com $\urcorner$ plete multiple design portfolios includ-ing evaluation of each of the produced models. A series of worksheets must be completed as well as the completion of an investigation into the design of a project using ICT resources.


## Yr 9 Technology - <br> Systems

Students will be exposed to the Arduino microcontroller where they will need to create various types of circuits using LCD screens, sensors, motors, LED's, buttons, buzzers to name a few. The real benefit of Arduino is learning a coding language to be able to program the microcontroller to perform certain tasks. This is the basics of real automation in any context such as robots or manufacturing systems.


## Pathways for Materials Technology



## Career Pathways:

Tech Automotive: Mechanic, Diesel Mechanic, Small engine mechanic, Auto Electrician, Aeronautical engineer, Race engineer

Tech Metalwork: Metalworker, Boiler maker, Specialist welder, Panel Beater, Fitter and Turner, Metal fabricator, CNC Production

Tech Woodwork: Carpenter, Cabinet Maker, Shop Fitter,
Builder, Pattern Maker

[^1]At least one unit is recommended to be chosen in your Middle School course for Year 9

- In all Arts units, students will be expected to maintain a workbook and to complete a research project.
- Please note that all items on the book list are essential (unless listed as optional) and contribute to a successful outcome in Art courses.
- Photography students and parents should note that they will be required to work in a number of locations including the darkroom, inside and outside the classroom where sometimes they will not be under direct teacher supervision. Students will be expected to behave according to school guidelines as set down in the Student Code of Conduct.


## Painting and Drawing

This course is designed to build students technical skill and knowledge in the more traditional art styles.
Students will experiment with a range of painting and drawing methods and develop compositional skills in arranging the the Art Elements and Principles.
Students will work on a range of topics such as Still Life, Portraiture and Landscape. Emphasis will be on visual analysis and practical interpretation of a range of artistic styles. This course will allow students to develop a sound understanding of the aesthetic characteristics associated with each art movements.

This course gives students foundation skill and knowledge required for VCE Art Creative Practice.


## Art Photography

This unit is an introduction to black and white photography and includes understanding the camera, processing films, printing and presentation of photos. Students wishing to take this unit are directed to the note on the top of this page concerning photography. Research will focus on photographic skills, studying renowned photographers and their work and the history of photography.

This course gives students foundation skill and knowledge required for year 10 advanced photography and digital photography.



## Art Ceramics

This course covers hand building and decorative techniques and processes. Interesting art works will be made using the coil, pinch and slab techniques. Students will use sgraffito, inlaying, stamping, marbling, slip trailing, slip casting and painting techniques and a range of media to enhance sculptures and ceramic objects. Students will respond to the Arts through researching a variety of ceramic artists and styles through history.
This course gives students skills and knowledge for year 10 ceramics and VCE Art Creative Practice.

## Art Visual Communication \& Design

In this unit students will explore the language of Visual Literacy through the use of the Design Elements and Principles.
Students will develop skills in two and three-dimensional drawing, incorporating the use of ICT where possible, to produce final outcomes in the fields of Communication, Information and Environmental Design. Students will be provided with the opportunity to work to a design brief and they will be encouraged to use the design process as a way of evaluating their design ideas and solutions.

This course gives students skills and knowledge for Year 10 Visual Design and VCE Visual Communication and Design.

| Unit 1/2 Art Creative Pratice | Unit 3/4 Art Creative Practice |
| :---: | :---: |
| VCE/VM Pathways <br> Photographer <br> Make-up Artist <br> Sign Writer <br> Tattooist <br> Florist <br> Interior Decorator <br> Printer <br> Vehicle Painter <br> Gallery Technician <br> Craftsperson <br> Artisan | VCE/Tertiary Pathways <br> Education <br> Graphic Designer <br> Conservator Architect <br> Curator <br> Exhibition Designer <br> Interior Designer Video <br> Game Designer Web <br> Designer Advertising <br> Marketing <br> Fashion Designer Visual <br> Merchandiser Antique <br> Appraiser |


[^0]:    - The Environment Under

    Threat

    - Geography 1 \& 2
    - Legal Studies 1 \& 2
    - Geography 3 \& 4
    - Legal Studies 3 \&4

[^1]:    Tech Systems: Electrician, Electrical Engineering, Automation, Transport, Renewable Energies, Mechatronics, Telecommunications, Control systems (robotics, signalling, CNC)

