Manufacturing Engineering Program
Catalog Description

Basic Mathematics and Science

200-112 Fundamental Mathematics for Engineer 3(3-0-6)

Mathematics in engineering; mathematical induction; functions and graphs; limit and continuity; derivatives of functions; applications of derivatives; integration of functions; application of integrals

200-113 Fundamental Physics for Engineer 3(3-0-6)

Physics in engineering; units, physical quantities, and vectors; force system and motions; work and moment; particles and rigid bodies; energy and momentum

200-114 Fundamental Chemistry for Engineer 2((2)-0-4)

Chemical in daily life and safety; physical properties of solid, liquid and gas; gas law; law of mass and stoichiometry; reaction and equilibrium; acid-base; electrochemistry; thermodynamics

226-102 Mathematics I 3((3)-0-6)

Vectors and matrices; systems of linear equations and elementary operations; analytic and parametric equations; curve, plane and surface representations; geometric transformation

226-104 Fundamental Chemistry Laboratory1 1(0-3-0)

Uncertainty of measurement; pH measurements and quantitative analysis by titration; thermochemistry; colligative properties of solutions; rate of reactions; electrochemistry; semimicro-qualitative analysis of anions and group I cations

332-101 Fundamental Physics 3((3)-0-6)

Vector, forces and motions; work and energy; momentum; vibrations and waves; sound; fluid mechanics; heat and thermodynamics; electricity and magnetism; light and optics.

333-101 Fundamental Physics Laboratory 1(0-3-0)

Measurement and errors; graphs and equations; force equilibrium; projectile motion; spring and oscillation; standing waves in a string; electric devices and multimeter; direct current circuit; alternating current circuit; diffraction gratings

226-201 Statistics and Probability 3((3)-0-6)

Properties of data and analysis; probability; random variable; probability distribution function; sampling distribution; estimation theory; test of hypothesis; analysis of variance; linear regression analysis; correlation; experimental design

226-202 Mathematics II 3((3)-0-6)

First order differential equations; second order ordinary differential equations with constant coefficients; higher order differential equations; linear differential equations with variable coefficients; Partial differential equations; Laplace transforms; Fourier series; numerical method; Euler's method; Runge-Kutta method

226-316 Chemistry I 3((3)-0-6)

Introduction to organic and physical chemistry; chemical bonding and functional groups; biological molecules; basic chemical reactions; solutions; chemical equilibrium; electrochemistry

226-367 Numerical Methods 2((2)-0-4)

Numerical methods in problems solving; solution of linear equation system; data interpolation; numerical integration and differentiation; numerical solution of the ordinary differential equation; numerical solution of the partial differential equation

324-102 General Chemistry II 3((3)-0-6)

Thermodynamics; chemical kinetics; aqueous acid-base equilibria; solubility and complexation equilibria transition element sand coordination compounds electrochemistry

Basic Engineering

200-115 Basic Electrical Engineering 3((2)-2-5)

DC circuit analysis; voltage, current and power; basic electrical components; Ohm's law and Kirchhoff's law; AC circuit analysis; real and reactive power; power factor; power factor correction; single-phase electricity bill; three-phase systems; transformers; introduction to electric machinery; electric generators and motors; introduction to electrical instruments

200-116 Basic Engineering Programming 3((2)-2-5)

Computer concepts, computer components; hardware and software interaction; electronic data processing concepts; high-level language programming concepts; program design and development methodology; data types; constant; operations and expression; statement and compound statement, flow controls, sequence, alteration and iteration; debugging; program design and development with applications to engineering problems using a high-level programming language; programming practices

200-117 Basic Engineering Drawing 2((2)-0-4)

The importance of engineering drawing; drawing instruments and their uses; lettering; line types and standards; applied geometry; pictorial drawing, oblique drawing, isometric drawings, orthographic drawing; freehand sketches; section drawing, dimensioning and descriptions in engineering drawing

221-101 Fundamentals of Machinery **3((3)-0-6)**

Fundamental concepts and principles of statics; two- and three-dimensional force systems; composition and resolution of forces; moments, couples and equivalent force system; equilibrium of particles and rigid bodies; free body diagrams; analysis of trusses, frames; friction; centers of gravity, centroids; moments of inertia of plane areas; Mohr's circle of moment of inertia

226-103 Thermodynamic and Heat Transfer **3((3)-0-6)**

The first and the second laws of thermodynamic, thermodynamic functions and applications; work and heat; properties of pure substances; thermodynamic properties of substances from graphs and tables and equations of state; Carnot cycle; entropy; heat transfer model; conduction, convection, radiation; heat transfer applications; heat exchangers; heat transfer enhancement; condensation and boiling

226-101 Introduction to Manufacturing Engineering **1((1)-0-2)**

Manufacturing curriculum introduction; skill and knowledge for manufacturing engineering; manufacturing engineering career path; innovative thinking

237-111 Engineering Materials **2(2-0-4)**

Study of structures, properties, production processes and applications of engineering materials i.e. metals, polymers, ceramics, composites, electronic materials, other materials, phase diagrams, mechanical properties and materials degradation

Manufacturing Engineering Core Course

226-203 Fundamentals of Machinery **3((2)-3-6)**

Kinematics of rigid bodies; relative motion; mechanism analysis; stress, strain, Hooke’s law; Mohr’s circle; stress and strain analysis of material and machine components; fluid properties; pressure and measurements of forces on rigid body in fluid; laminar flow and turbulent flow; flow inside pipe; frictions and pressure losses along pipe; flow measurement; Laboratory for mechanism Analysis, beam Experiment, flow and friction Loss in Pipe, conduction

heat transfer, tension and bending test, cam analysis, vibration experiment, centrifugal pump test, piston pump test, flow measurement

226-204 Module: Computer Aided Product Design and Drawing 5((4)-3-8)

Computer modelling in 2D and 3D; surface modeling; assembly modeling; geometric dimension and tolerance; technology for computer aided design; product design for industry 4.0, creative product design; identifying customer needs; product functional requirements; product architecture; material and process selection; product development tools and techniques such as patent search; design for manufacturability and assembly; design for eco-friendly; product selection techniques for decision support such as house of quality, AHP, economic analysis, concurrent Engineering and reverse engineering; laboratory for computer aided design; design project

226-211 Module: Manufacturing Processes 5((3)-4-8)

Industrial manufacturing processes, manufacturing components and production factors; manufacturing processes such as foundry, metal forming, material cutting, powder forming, plastic forming, fusion welding, other types of welding, heat treatment; basic computer aided manufacturing, basic computer aided engineering analysis; basic precision measurement and metrology; laboratory for turning, milling, shaping, grinding, boring, drilling, casting, dimensional precision measurement

226-212 Forming Technology 3((2)-3-4)

Material properties for metal, rubber, and plastic forming; sheet metal forming; bulk forming; fundamental of metal forming processes; forging, rolling, extrusion, drawing; powder metallurgy, rubber and plastic, plastic injection processes; factors and tools involving metal forming and plastic injection processes; additive manufacturing; laboratory experiments in sheet metal forming, 3D printing, computer aided design for sheet metal forming, plastic injection

226-213 Tool Engineering 3((3)-0-6)

Fundamental of machining tools; positioning and clamping devices; calculation for force transmission of mechanical components such as wedge, cam, screw, toggle; gauge and measuring instruments; instrument calibration; project of jig and fixture design

226-221 Law, Work System, and Safety in Manufacturing 2((2)-0-4)

Work systems for industry; engineering acts, factory acts, the machinery registration acts, hazardous substance acts; legal proceeding for establishing a factory; labor relations, labor welfare and social security laws; environmental and factory safety laws; principle of safety management system; hazard analysis and risk assessment; first aid; fire prevention and suppression; environmental management; corporate social responsibility

226-231 Quality Control and Management for Manufacturing 3((3)-0-6)

Quality systems, quality cost analysis, statistics for quality control, sampling plan, control charts; quality improvement concepts, tools and systems for supporting quality improvement, statistics for quality improvement; total quality management; solving processes for quality problems; qc story

226-241 Engineering Economy and Decision Making 2((2)-0-4)

Fundamental of economics; cost management; concept of production cost; time value of money; depreciation; project evaluation; comparison and selection of present value, annual value; internal and external return rates; benefits of investment; financial analysis; cost analysis; cost structure; breakeven analysis; property replacement; decision making under risk and uncertainty

226-311 Module: Machining Engineering and Machinery Technology 5((4)-3-8)

Machining; calculation and analysis of cutting forces, heat and temperature in cutting, surface roughness and involved factors; tool wear and tool life; economic of machining operations; conventional and modern machining technology; computer aided machining analysis; computer aided manufacturing and process planning; numerical control programming; automatic machine; computer integration in industry; laboratory for studying cutting factors effecting to cutting forces, tool temperature, surface roughness, numerical control programming, automatic machine controller, CNC, computer aided manufacturing, laser cutting

226-312 Machining Engineering and Machinery Technology 3((3)-0-6)

Concept design of industrial machines; computer aided simulation of machine structure, machine propulsion and machine mechanism; failure theory of static condition and fatigue condition; technologies of computer aided engineering analysis; machine design and engineering analysis project

226-321 Module: Manufacturing Automation and Material Handling for Digital Factory) 5((4)-3-8)

Fundamental of control techniques and their applications; mechanical control, electrical control, pneumatics control, hydraulics control; feedback control and its response; PLC; analog, binary, and digital sensors; CNC machine; flexible manufacturing system; industrial robots; industrial internet of things; material handling system, material handling equipment, unit loads, automated storage/retrieval systems (AS/RS); digital factory management, basic knowledge and components of digital factory, augmented reality technology, data flow diagram, industrial case study; project of manufacturing automation and material handling for digital factory; laboratory of mechanical control, electrical control, feedback control, PLC, industrial robot programming, material handling system design, digital factory design

226-351 (Module: Integrated Productivity Management) 5((4)-3-8)

Manufacturing system, forecasting techniques, inventory management, enterprise resource Planning (ERP), analysis of cost and profit in industry, production planning, scheduling, maintenance management; plant allocation, machine load and manpower calculation, assembly line balancing, material handling, simulation of manufacturing line in industry; productivity improvement concepts, production capacity, productivity techniques, 7 wastes of production process, continuous improvement; work study, motion economy, use of charts and diagrams for work activities analysis, standard time determination; biomechanics, working environments, tools and equipment design, workstation and workplace design, displays by ergonomics principle; operation research, linear programming, simplex method and duality theory, transportation model, decision making process, game theory, inventory modeling, queuing theory, dynamic programming, simulation; project management; supply chain management; computer software for management, IoT technology for productivity

226-361 Skills for Professional Manufacturing Engineer 1(0-3-0)

Work preparation; entrepreneurship; research planning; project proposal for industrial solving; report writing, oral presentation, skills of using office software; English skills in reading, writing, and speaking

226-362 Practicum At Least 320 Hours

Students with third-year status are required to complete training of related manufacturing engineering in industrial organizations, at state enterprises, private enterprises, and other organizations which is obtained approval of department for 320 hours and the student performance will be evaluated by the evaluation procedure setting by the faculty of engineering

226-462 Manufacturing Engineering Project II 7(0-28-0)

Continuation of 226- 461, students work on the selected manufacturing engineering project under the supervision of department's faculty members; the project may be design and development, fabricating, or any topics related to manufacturing engineering problems; students have to submit final reports and make oral presentation at the end of semester; In addition, students must have 50 percentages of project hours in industry

Manufacturing Engineering Options

226-461 Manufacturing Engineering Project I 4(0-16-0)

Investigate selected manufacturing problems under the supervision department's faculty members; specify topic, literature reviews and/or preliminary studies, write the proposals, operate project to finish project in 226-444 manufacturing engineering project II; In addition, students must have 50 percentages of project hours in industry

226-465 Case Study and Industrial Plant Visit 3((3)-0-6)

Plant visit of selected industry, production management system, manufacturing process, infrastructure, and production support system such as mechanical system, heat power system, ventilation system, electrical system and treatment system; case study in industrial system or local communities in southern region

226-463 Cooperative Education I 7(0--35-0)

Study and train as a full-time staff of an approved workplace, establishment of a professional skill based on the integration of classroom theory and practical work experience, at least 16 weeks or one semester in the workplace, develop one project, evaluation carried out by both the project advisor and the entrepreneur

226-464 Cooperative Education II 7(0-28-0)

Continuation of 226- 463, study and train as a full-time staff of an approved workplace at least 16 weeks or one semester in the workplace, develop the completed project, evaluation carried out by both the project advisor and the entrepreneur, oral presentation and final report submission to the entrepreneur

Manufacturing Engineering Elective

226-313 Advanced Welding Technology 3((2)-3-4)

Fundamentals of welding, arc welding, press welding; modern welding process, MIG/MAG welding, TIG welding, submerged arc welding, plasma are welding, laser welding, electron beam welding, friction stir welding, resistance welding, thermit rail welding; main factors and application in welding; welding of steels, stainless steel, aluminum; designing of welding joint; welding wire selection; destructive and non-destructive testing; quality control in welding and assembling; industrial robots for welding; case study of welding in industry

226-314 Rubber Product Design and Manufacturing 3((3)-0-6)

Principle of rubber product design; rubber material properties; material and process selection; tools for design, manufacturing, and engineering analysis; rubber molding process; mold components; mold design process; mold making process; rubber mold design project

226-315 Special Topics in Manufacturing Engineering I 3((x)-y-z)

The subject concerned with valuable special topics and interest in manufacturing engineering, and approved by the board of faculty of engineering

225-352 Maintenance Engineering 3((3)-0-6)

Maintenance concept; machine life cycle; maintenance type; maintenance organization; maintenance material management; maintenance work flow and data; machine deterioration; inspection and lubrication system; maintenance cost; maintenance planning and scheduling; maintenance evaluation; total productive maintenance; predictive maintenance; application of augmented reality (AR) and internet of things technology (IOT) for predictive maintenance in industry 4.0; doing case studies and problems in real-world situations through collaboration with industrial partners

226-322 Logistics Management and Material Handling 3((3)-0-6)

Logistics and supply chain principle; warehouse management, warehouse design; definition and relation between logistics and material handling system; material handling equipment, material handling function, automatic material handling and storage system; IoT-based logistics and material handling; automatic systems for material handling

226-323 Ergonomics and Work Study 3((3)-0-6)

Definition and history of ergonomics and work study; structure and systems of human; energy consumption based on activities; working environments; tools, equipment and work place design based on ergonomic principle; study of work motion; work measurement; time study process; evaluation of work load; calculation of normal time and standard time; incentive wage

226-324 Industrial Robots 3((3)-0-6)

Principles and applications of industrial robots in modern manufacturing systems. Robot classifications and configuration. Components and control. Kinematics analysis and control. Robot and system integration. Justifying the cost of robots. Operations and programming

226-325 Smart Warehouse Management 3((3)-0-6)

Industrial 4.0; warehouse and warehouse management definition; importance of warehouse management; warehouse activities; warehouse handling equipment; warehouse cost, ABC analysis; forecast; warehouse design; smart warehouse and warehouse management; automation system in warehouse; economic analysis for automatic warehouse and warehouse management; co-project with the real factories

226-326 Machine Vision for Manufacturing System 3((3)-0-6)

Basic digital image; type of image collection; image processing; technology of image analysis; machine vision; connection between vision system and machine; application of image processing for manufacturing process; programing of image processing

226-327 Smart Material Handling System 3((3)-0-6)

Fundamental of machine control and automatic handling system for modern factory; material handling equipment, industrial robot, robot palletizer, automatic guided vehicle, drone for material transfer; system design and layout of machine group and equipment for modern factory; robot programming; simulation of belt conveyor system; computer simulation software, visual component 4.0; 3D Modeling component project

226-328 Special Topics in Manufacturing Engineering II 3((x)-y-z)

The subject concerned with valuable special topics and interest in manufacturing engineering, and approved by the board of faculty of engineering

226-331 Quality Assurance System in Manufacturing 3((3)-0-6)

Concept of quality assurance; quality control of materials, quality control of manufacturing processes; quality assurance system in industry; quality standards; quality management; quality assessment; quality accreditation

226-332 Quality Improvement in Manufacturing 3((3)-0-6)

Concept of quality improvement in manufacturing processes; objectives of quality improvement; statistics for quality improvement in manufacturing processes; tools and system for supporting quality improvement; case study of quality improvement

226-333 Special Topics in Manufacturing Engineering III 3((x)-y-z)

The subject concerned with valuable special topics and interest in manufacturing engineering, and approved by the board of faculty of engineering

225-342 Industrial Cost Analysis and Management 3((3)-0-6)

Logistics and supply chain principle; warehouse management, warehouse design; definition and relation between logistics and material handling system; material handling equipment; material handling function; automatic material handling and storage system

226-437 Digital Factory Management 3((3)-0-6)

Digital factory management; basic knowledge and components of digital factory; augmented reality technology; data flow diagram for digital factory, industrial case study

General Education

GE 1 Royal Science and Benefits to Fellow Humans

001-102 The King's Philosophy and Sustainable Development 2((2)-0-4)

Meaning, principles, concept, importance and goal of the philosophy of sufficiency; work principles, understanding and development of the King' s philosophy and sustainable development; an analysis of application of the King' s philosophy in the area of interest including individual, business or community sectors in local and national level

388-100 Health for All 1((1)-0-2)

Principle and steps of basic life support, practice of basic life support in simulated situation; common mental health problems, warning signs, initial assessment and care; concepts of health and health promotion; first aid

230-001 Benefit of Mankind's 1 ((1)-0-2)

The integrative activities emphasizing the philosophy of sufficiency economy, work principles, understanding and development of King's philosophy for the benefits of mankind

GE 2 Citizenship and Peaceful Life

895-001 Good Citizens 2((2)-0-4)

Role; duty and social responsibility as a citizen; social organization; law; right; liberty; equality; living together in a multicultural society

950-102 Happy and Peaceful Life 3((3)-0-6)

Consciousness and mindfulness; happiness; self-awareness; social literacy; understanding and respecting diversity; communication and collaboration skills; creative problem-solving; living in diversity

GE 3 Entrepreneurship

001-103 Idea to Entrepreneurship 1((1)-0-2)

Introduction to new entrepreneur creation; business environment analysis; survey for business opportunity analysis; using business models with modern business tools

GE 4 Living knowingly and digital literacy

GE 4.1 Living knowingly

315-201 Life in the Future 2((2)-0-4)

Climate change in the future; biotechnology and nanotechnology; clean energy; information technology for living in the future; artificial intelligence

820-100 Save Earth Save Us 2((2)-0-4)

Concept for creative, sustainable, and environmentally friendly living, survival, and adaptation in the changing environment, science and technology, and society including environmental awareness raising with up-to-date edutainment for young generation

200-103 Modern Life for Green Love 2((2)-0-4)

Current situation of world environment, natural resources for living; current pollution in community; current situation of water usage and impact from daily life; current situation of air pollution and solid waste; natural resources and pollution management

142-121 The Future Earth 2((2)-0-4)

Advancement in science; fast-growing technologies and their impacts on human life and modern society in 21st century; new energy, green energy, alternative energy; ecosystem and environment; global and social problems; drawbacks of the advancement

472-115 Survival 101 2((2)-0-4)

Understand and learn how to survival; how to handle the situation; survive in different situations such as natural disasters; earthquake; flooding and tsunami disaster; learn self-defensive to protect from crime; and apply the knowledge in daily life

GE 4.2 Digital literacy

345-104 Digital Technology Literacy 2((2)-0-4)

Learn and utilize current technology and future trends in a secure and understandable way; practice the applications needed to work; uses of cloud computing applications for work effectively

200-107 Internet of Thing for Digital Life 2((2)-0-4)

Introduction to modern computer technology; introduction to modern communication technology; smart internet usage; introduction to Internet of Things; introduction to program applications for 21st century skills

142-225 The 5st Need 2((2)-0-4)

The importance and influence of social media in digital age; age groups of each generation and social media; social media applications; social media in digital age for education and educational entertainment; advantages and disadvantages of social media; computer crime act and information privacy

472-113 Black and White 2((2)-0-4)

Understand and know social media in digital age; creating benefit for society by using social media; understand the disadvantage from using social media

GE 5 Systematic thinking, Logical thinking and Numerical thinking

GE 5.1 Systematic thinking

315-202 Thinking and Reasoning 2((2)-0-4)

The definitions and importances of thinking and reasoning; brain thinking process; types of thinking; causality; reasoning; scientific and innovative thinking

895-011 Creative Thinking 2((2)-0-4)

Thoughts and happiness; cognitive styles; method of determining; happiness styles; positive thinking; happiness and education; happiness and relationships; applying thinking styles in living and working

895-012 Positive Thinking 2((2)-0-4)

Positive thinking; examining one's own thought; life skills and aims of living

142-124 Creative Problem Solving 2((2)-0-4)

Factors and causes of problem; understanding the problem; types of problems, problem solving steps; algorithm; thinking for decision making and algorithm; problem solving with algorithm; critical thinking and ideas; reliability and relevance; sources of information, understanding the sources of information, evidence, facts, validity, and reliability

472-114 Creative Thinking 2((2)-0-4)

Thinking out of the box and generate ideas; developing creativity thinking through brainstorming; mind mapping; reframing and role playing

GE 5.2 Logical and Numerical thinking

322-100 The Art of Computing 2((2)-0-4)

Mathematics in surrounding; mathematical modeling for life; interest rate; annuity; collection and management data; introduction to data analysis and presentation

895-010 Thinking and Predictable Behavior 2((2)-0-4)

Systematic thinking; problem solving; behavioral science; decision making; behavior prediction

142-129 Organic Thinking 2((2)-0-4)

Analytical thinking; presumption and assumption; hypothesis; convergent and divergent thinking; data finding; problem and solution finding; predictions; logical; numerical analysis; relating and creating things; value adding

472-118 Pocket Money 2((2)-0-4)

The importance of money saving; saving target; saving and spending plan to achieve target effectively; calculation of saving for emergency case

GE 6 Language and Communication

890-001 Essential English 2((2)-0-4)

Essential English grammatical structures and vocabulary; pronunciation; basic skills in listening, speaking, reading, and writing sentences and short messages

890-002 Everyday English 2((2)-0-4)

Listening and reading in English on familiar, straightforward topics for main ideas and details; grammatical structures and expressions for everyday spoken and written communication

890-003 English on the Go 2((2)-0-4)

English listening and reading on current topics for comprehension, summarization and interpretation; complex grammatical structures and expressions for everyday spoken and written communication in various contexts

890-004 English in the Digital World 2((2)-0-4)

Listening and reading in English in the digital world; critically responding to listening and reading texts through speaking and writing

890-005 English for Academic Success 2((2)-0-4)

English listening and reading in academic contexts; analyzing and responding critically to academic texts through speaking and writing

GE 7 Aesthetics and sports

GE 7.1 Aesthetics

895-020 Thai Khim 1((1)-0-2)

Thai Khim; components of the Thai Khim; Thai Khim practice; playing Song Chan or moderate rhythm traditional Thai music with a Thai Khim.

895-021 Singing, Playing, Dancing 1((1)-0-2)

Folk music; singing and folk musical instruments; Klong Yao Dance; Kin Khao Song; Ten Kam Ram Khieo Song; Ngu Kin Hang Song

895-022 Rhythm and Song 1((1)-0-2)

Thai percussion instruments, Ranat Ek, Ranat Thum, Khong Wong; rhythm and percussion instruments, Klong Yao, Klong Khaek, Thon, Rammana, Ching, Chap, Krap, Long-playing basic traditional Thai music

895-023 Guitar 1((1)-0-2)

Basic guitar lessons; tone; sound quality; music scale; guitar melodies; popular music

895-024 Ukulele **1((1)-0-2)**

Basic ukulele lessons; tone; sound quality; music scale; ukulele melodies; popular music

895-025 Harmonica 1((1)-0-2)

Basic harmonica lessons; tone; sound quality; music scale; harmonica melodies; popular music

895-026 Drama and Self-reflection 1((1)-0-2)

Aesthetics of the film and drama; food for thought; human identity; cultural reflection from the film and drama

895-027 Appreciation in Thai Language 1((1)-0-2)

Linguistic features affecting thoughts, feelings, values and aesthetics expressing meanings as intended

895-028 Creative Drawing 1((1)-0-2)

Drawing environments; sketching three dimensional images; drawing from imagination

340-162 The Aesthetic in Photography 1((1)-0-2)

Light and shadow; Image composition; aesthetics in natural and environmental photography; aesthetics in human behavioral Imaging; aesthetics in photography for the arts; aesthetics in photography for communication

061-001 Aesthetics of Thai Dance 1((1)-0-2)

General knowledge about Thai dance; costumes for Thai dance; songs for Thai dance; basic Thai dance movements; Thai dance performances

472-116 Local Arts and Fabric 1((1)-0-2)

Learning, knowing value and appreciate the local arts; knowing the arts of reflecting life of local people through visiting and exchanging knowledge with the community leaders

142-234 Life is Beautiful 1((1)-0-2)

Development of life aesthetics based on multicultural understanding; power of positive attitude; feeling and absorbing the beauty of life through arts, nature and other aesthetic creations; getting to know yourself and others through expressive art; stress release and relaxation through different types of arts; searching for inspiration and spirit; peaceful coexistence

142-135 Paper Craft 1((1)-0-2)

Paper craft workshop, cutting, folding, creating artworks from paper

142-136 Sculpture 1((1)-0-2)

Molding sculptures using various materials such as natural clay or Japanese clay; Learning how to manipulate these materials and use sculpting tools safely; Appreciating and Criticizing sculpture works through reading and discussion; Examining geometric, abstract and organic forms. Fundamentals of sculpture program

142-137 Everyone Can Draw 1((1)-0-2)

Introduction to basic drawing and practice; sketching; basic drawing, light and shadow; human figures

142-138 The Sound of Music 1((1)-0-2)

Exploration of historical periods of both Eastern and Western art music; musical styles, musical elements, and composers and their works; basic musical concepts; develop music perception skills and representative musical compositions

142-139 Through The World of Art 1((1)-0-2)

Art of Visual art, medium and technique in art creation

142-237 The Designers and Their Black Attires 1((1)-0-2)

Evolution of design, fundamental of design, design process, design in relation to daily basis

GE 7.2 Sports

895-030 Swimming 1((1)-0-2)

Body movements for swimming; swimming activities; application of swimming activities for health promotion and social skills in daily life

895-031 Tennis 1((1)-0-2)

Body movement with tennis; activities tennis; the use of tennis as a medium to enhance the health and social skills needed in everyday life

895-032 Basketball 1((1)-0-2)

Physical fitness; basic movements; basic techniques and skills in basketball; rules; etiquettes of players and spectators; improve the quality of life

895-033 Track and Field 1((1)-0-2)

Body movements for track and field; track and field activities; application of track and field activities for health promotion and social skills in daily life

895-034 Social Dance 1((1)-0-2)

Body movements for social dance; social dance activities; application of social dance activities for health promotion and social skills in daily life

895-035 Petanque 1((1)-0-2)

Body movement with petanque; Petanque activities; the use of petanque as a medium to enhance the health and social skills needed in everyday life

895-036 Camping 1((1)-0-2)

Background; values of camping; conserving natural resources and camping; types of camping; camping activities; being good leaders and followers; rules; camping etiquettes; application of the skills

895-037 Badminton 1((1)-0-2)

Body movements for badminton playing; badminton activities; application of badminton activities for health promotion and social skills in daily life

895-038 Table Tennis 1((1)-0-2)

Body movement with table tennis; using table tennis as a medium for health promotion; application in daily life

895-039 Exercise for Health 1((1)-0-2)

Objectives, values and benefits of physical exercise; physiology of exercise; physical fitness; criteria and formats of activities; selections of exercise model; application in daily.