Catalog Description

Basic Mathematic 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, liguid and gas; gas law; law of mass and stoichiometry; reaction and equilibrium; acid-base; electrochemistry; thermodynamics

230-101 Basic Chemistry in Chemical Engineering 3((3)-0-6)

Introduction to organic and physical chemistry; chemical bonding and functional groups; biological molecules; basic chemical reactions; solutions; chemical equilibrium; electrochemistry; applications of basic chemistry knowledge in chemical engineering and related technologies

230-141 Basic Chemistry Laboratory in Chemical Engineering 1(0-3-0)

Preparation of solution; physical property measurements; basic chemical composition analyses

230-203 Mathematics in Chemical Engineering I 3((3)-0-6)

Linear system; partial derivative; ordinary differential system equations and solve methods; Laplace transform; partial differential equations; numerical methods for differential equations and software

230-304 Mathematics in Chemical Engineering II 3((3)-0-6)

Opimization; regression; experimental design and statistical analysis

347-206 Statistics 3((3)-0-6)

Meaning of statistics, data and measurement, statistical methods, procedures for collecting and presentation data, measure of central tendency and dispersion, probability, random variable and probability distribution, sampling distribution, estimation and testing hypothesis, analysis of variance, categorical data analysis, linear regression analysis and correlation, data analysis and presentation by MS Excel, applications of statistics in everyday life

324-249 Analytical Chemistry I 3((3)-0-6)

Introduction to analytical chemistry; data analysis; solubility equilibria; chemical equilibrium of acid-base reaction; precipitation; complex compound formation; redox reaction; titration and its applications; fundamental of different separation methods

324-249 Analytical Chemistry II **3((3)-0-6)**

Principle and selection of the modern chemical analysis technique: Liquid Chromatography (LC), Gas Chromatography (GC), UV-Visible Spectrophotometer, Fourier Transform Infrared Spectrophotometer (FT-IR), Atomic Absorption Spectrophotometer (AAS), Mass Spectrometry (MS), Bomb Calorimeter

328-303 Basic Biochemistry **3((3)-0-6)**

Biochemistry; structure; properties and metabolism of sugars, polysaccharides, amino acids, proteins and lipids; bioenergetics; biochemical utilization.

Basic Engineering

200-111 Into Engineering World **2((2)-0-4)**

Evolution of engineering disciplines; engineering professional organizations; engineering career path; engineering ethics; engineering problems; systematic problem analysis and solving; teamwork; presentation techniques

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

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

Chemical Engineering Core Course

230-201 Material and Energy Balances 4((4)-0-8)

Introduction to chemical engineering calculation: stoichiometry and material balance calculation; recycling, bypassing and purging; use of chemical and phase equilibrium data; energy balance

230-202 Chemical Engineering Processes 3((3)-0-6)

Studies of production processes in industrial plants; process flow diagram;piping and instrument diagram;raw materials, energy, industrial equipment, safety and environment impacts; visit study of related factory

230-211 Fluid Mechanics and Applications 4((4)-0-8)

Fluid static and fluid dynamics; fluid flow phenomena and basic equations of fluid flow; Internal flow; pump; momentum transfer; characterization and properties of solid particles; size reduction; mixing; mechanical separation of solids from fluid; applications of fluid and solid mechanics: turbomachinery, screening, filtration, sedimentation, centrifugal separation, cyclone, mixing, fluidization

230-212 Thermodynamics 3((3)-0-6)

The first and the second laws of thermodynamics, thermodynamic functions and applications; work and heat; properties of pure substances; thermodynamic properties of substances from graphs, tables and equations of state; fluid flow inside pipes and flow through nozzles; Carnot cycle; entropy

230-213 Chemical Engineering Thermodynamics 3((3)-0-6)

Properties of pure fluid; cubic equations of state; generalized correlations for gases and liquids; residual property, phase equilibrium and vapor-liquid equilibrium, properties of mixture; excess property; fugacity; activity coefficients; gibbs-duhem equation; property changes of mixing; heat effects of mixing processes

230-214 Heat Transfer 3((3)-0-6)

Fundamental of heat transfer; steady heat conduction and transient heat conduction; natural convection and forced convection; heat transfer coefficient; heat exchange equipments and conceptual design

230-215 Fundamental of Thermodynamics and Fluid Flow 3((3)-0-6)

Fundamental concepts in thermodynamics; the first and second law of thermodynamics; basic concepts and basic properties of fluids; fundamentals of fluid statics; fundamentals of fluid dynamics; characteristics of fluids such as laminar and turbulent flow

230-221 Chemical Engineering Kinetics and Reactor Design 3((3)-0-6)

Application of thermodynamic and kinetic fundamentals to the analysis and design of chemical reactors; type of reactors: single reactor and multiple reactor systems; isothermal and non-isothermal reaction: homogeneous reactors and introduction to heterogeneous reactors

230-241 Fluid Mechanics and Particle Laboratory 1(0-3-0)

Experiments in fluid mechanics and particle; pump, blower; turbine, cyclone; filter

230-242 Chemical Engineering Laboratory I 1(0-3-0)

Design and conduct experiments related to themodynamic properites and heat transfer; enthalypy of evapolation, enthalpy of solution, heat convection; forced conduction; heat exchanger

230-301 Economics and Applications 3((3)-0-6)

Introduction to general economics; accounting data and financial statements; time value of money; economic evaluation for alternative selection and investment of chemical engineering processes

230-321 Unit Operations I 3((3)-0-6)

Theory of diffusion; Fick's first law; prediction of diffusivities; mass transfer theories; mass transfer coefficient; mass transfer application and conceptual desgn, evaporation, drying; adsorption, crystallization

230-322 Unit Operations II 3((3)-0-6)

Separationprocess by phase and chemical equilibriums; principles of distillation; binary distillation; multicomponent distillation; gas absorption; liquid-liquid extraction; leaching

230-330 Module : Environmental Control and Safety in Chemical Engineering Operations 7((6)-3-12)

Impacts of environmental pollution; environmental quality standards; source and characteristics of pollutants and industrial wastes; treatment of wastewater, air pollution and harzardous wastes; principles of safey and loss prevention control; hazard identification and handling; risk assessment; principles of safety management; legislation and safety laws; environmental system management standard ISO 14001; occupational health and safety management system standard OHSAS 18000; Design and conduct experiments in environment and process safety analysis; determination BOD, COD; determination of heavy metal; adsorption; flocculation

230-331 Chemical Engineering Equipment Design 3((3)-0-6)

Design information; standards and codes in equipment design; material of construction; design of process plant piping; fluid control instruments; fluid movers; pressure vessels; mass transfer equipments; equipment pressure drop

230-341 Chemical Engineering Laboratory II 1(0-3-0)

Design and conduct experiments in separation process by heat and mass transfer; drying; mixing; evapolation; distillation; liquid-liquid extraction; liquid-solid extraction; gas adsorption

230-343 Chemical Engineerign Seminar 1(0-2-1)

Seminar: attendance and discussion on the topics related to chemical engineering; project management; presentation technic

230-344 Industrial Excursion At least 40 hours

Industry plant visitrelated to chemical engineering field to increase knowledge and experience for period of 5-10 days or 40 hours

230-345 Pre Practical Training 1((1)-0-2)

Personal pre paration for cooperative; resume; self-introduction; fundamental industrial machine practice; computer aids for drawing;process simulation

230-346 Practical Training 320 hours

Training in chemical engineering in organization approved by the department at least 8 weeks not less than 320 hours

230-421 Integrtated Knowledge in Chemical Engineering 3((3)-0-6)

Integrate knowledge of chemical engineering including simulation program environment and safety impact assessmentusing case studies related to area of petrochemical, renewable energy, food, herb, oil palm and rubber

230-430 Module : Chemical Engineering Plant Design and Chemical Process Simulation

6((5)-3-10)

Project administration and management;Concept and procedure for plant design; Heuristics rules; Environmental and safety considerations; Consideration of utilities use in plant

design; Equipment cost estimation and Economic analysis; Process simulation by Aspen Plus; Heat exchanger network design; Optimum design; Process design project of a chemical plant; using process simulator program to simulate and design chemical unit operation

230-431 Process Dynamics and Control 3((3)-0-6)

Chemicalprocess control and variables; mathematical modeling of chemical engineering systems; solution techniques; transfer function; dynamic of first order and higher order systems; control system instrument and automatic control system; feedback control; dynamic and stability of control system; frequency response; control system design; introduction to advance control systems

230-442 Chemical Engineering Project I 1(0-2-1)

Perform a review of a research work under the chemical engineering topic; plan a research methodology; prepare a proposal and presentation under supervision of project advisor

230-443 Chemical Engineering Project II 3(0-6-3)

Perform an experiment according to the experimental design; observing and discussing the obtained results; prepare a research presentation and a research manuscript supervised by project advisor

230-444 Pre-Cooperative Education 1((1)-0-2)

Personal preparation for cooperative, resume, self-introduction, interview; tool for cooperative, computer aids for drawing, spread sheet, process simulation

230-445 Cooperative Education 6(0-40-0)

Training in chemical engineering in organization approved by the department for a period not less than 16 weeks; evaluation carried out by both the advisor and the entrepreneur; at the end of operation student must have oral presentation and submit a final report to the entrepreneur and advisor

Chemical Engineering Elective

230-451 Corrosion Engineering 3((3)-0-6)

Principles of corrosion; electrochemistry; metallurgy; material properties; impact of parameters related to corrosion; type and cause of corrosion; corrosion rate and corrosion testing; corrosion prevention and control

230-452 Petrochemical Technology 3((3)-0-6)

Introduction to basic concepts of petroleum and petrochemical industries; sources of petroleum; surveying and drilling crude oil; economic aspects of refinery; processes of manufacturing crude oil products; analytical method of petroleum products; distillation and petroleum processing; natural gas industries; petrochemical industries

230-453 Natural Gas Technology 3((3)-0-6)

Physical, chemical, processing of natural gas and its by-products; phase equilibria and vapour liquid equilibrium calculations; water-hydrocarbon systems and natural gas dehydration; natural gas gathering and plant inlet separation; sour natural gas treating/sweetening; dew point control and NGL liquid recovery

230-461 Innovations of Food and Biomaterial Drying Process 3((3)-0-6)

Overview of processes for preserving and transforming food; theory and food chemistry; principle of drying in foods and biomaterial using innovation technologies; microbial control, evaluation and statistical data analysis of sensory properties; sustainable energy and renewable energy resources in dehumidification of food chemistry industries such as conductive; convective and irradiative heat transfer; emerging technologies including technique's ability to enhance extraction of intracellular compounds and improved physical and chemical properties of foods and biomaterial

230-462 Ethanol Technology 3((3)-0-6)

Basic knowledge about plant-based fuels; introduction to raw materials and production processes by focusing on ethanol technology with a biochemical process; its utilization or its application; effect on environment and analysis of the feasibility of ethanol industry

230-463 Food Unit Operations 3((3)-0-6)

To study and understand different types of foods, chemical reactions in food systems, as well as food processing systems in order to be able to develop new and innovative food product that meet the consumer needs and trends.

230-471 Energy Technology and Management 3((3)-0-6)

Study world energy uses situation and trends to change of energy use; Alternative Energy Development Plan of Thailand (AEDP); Basic principle of energy resources from fossil such as petroleum, coal, natural gas, synthetic fuel gas; Renewable energy resources such as solar energy, wind energy, hydropower, biomass energy; Alternative energy such as nuclear energy; Energy technology and energy management including to application of various energy system and energy management for each energy resources

230-472 Process Safety Management 3((3)-0-6)

Requirement of process safety management; process safety information; chemical; technology, equipment; process hazard analysis; incident investigation

230-473 Air Pollution Control Technology for Gaseous and Particulate Emissions 3((3)-0-6)

Principles, operations and applications of air pollution control devices; settling chamber;cyclone; fabric filter; electrostatic precipitator; wet collector; adsorption column; condenser; incinerator and absorber; factor affecting control equipment selection; estimating cost for air pollution control devices

230-474 Engineering Comunication 3((1)-6-2)

Engineering report; concept project proposal; project presentation; project pitching

230-481 Computer Applications for Chemical Engineers 3((3)-0-6)

Computer application for Calculation in thermodynamics; conservation of mass and energy; kinetics; transport phenomena of mass, heat and momentum; data regression analysis

230-482 Fluid Dynamics and Heat Transfer Phenomena Simulations 3((3)-0-6)

Using the commercial software for analysis; formulation of mathematical models and solving the fluid dynamics and heat transfer problems in chemical engineering for steady and transient behavior; design the equipment for chemical engineering such as heat exchanger and reactors

230-491 Special Topics in Chemical Engineering I 1-3(x-y-z)

Current topics of interest in chemical engineering as arranged by the Department approved by the faculty committee

230-492 Special Topics in Chemical Engineering II 1-3(x-y-z)

Current topics of interest in chemical engineering as arranged by the Department approved by the faculty committee

230-493 Special Topics in Chemical Engineering III 1-3(x-y-z)

Current topics of interest in chemical engineering as arranged by the Department approved by the faculty committee

230-494 Special Topics in Chemical Engineering IV 1-3(x-y-z)

Current topics of interest in chemical engineering as arranged by the Department approved by the faculty committee

225-452 Business Management for Engineer and Entrepreneurship 3((3)-0-6)

Type of entrepreneur; entrepreneurship appraisal; business idea generation; business opportunity analysis; business model canvas; production management; marketing and finance for entrepreneur; business ethics; doing case studies and problems in real-world situations through collaboration with industrial partners; job shadowing of entrepreneur

226-232 Manufacturing Management and Productivity 3((3)-0-6)

Organization profile in project management, operation system, operation management, operation strategy, project planning, factory allocation, project control and operation, project evaluation and delivery; maintenance concept, maintenance work flow and data, maintenance cost, maintenance planning and scheduling, total productive maintenance; applying theory and productivity in industrial manufacturing

226-334 Production and Operation Management 3((3)-0-6)

Manufacturing systems; product and process analysis; machine selection and load calculation; manpower requirement; activity, flow and space relationships; assembly line balancing techniques; basic types of layout and plant layout; forecasting techniques; Inventory management; material requirement planning; analysis of cost and profit in industry and service; scheduling; basic concept of operation research for manufacturing problems by using computer programming

226-335 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

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 sustainabledevelopment; 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 Mankinds 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 environmental friendly living, survival, and adaptation in the changing environment, science and technology, and society including environmental awarenessraising 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 lifeand 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 programapplications for 21st century skills

142-225 The 5th need 2((2)-0-4)

The importance and influence of social media in digital age; age groups of eachgeneration and social media; social media applications; social media in digital age for educationand 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 usingsocial 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 stylesin 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, evidences, facts, validity and reliability

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

Thinking out of the box and generate ideas; developing creativity thinking throughbrainstorming; 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; behaviorprediction

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; numberical 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 andwritten 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; Kieo Khao Song; TenKam 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, Mong;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 Musics 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 andfield 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 danceactivities for health promotion and social skills in daily life

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

Body movement with petanque; activities petanque; 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 ofcamping; 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; physicalfitness; criteria and formats of activities; selections of exercise model; application in dailyl