جامعة المنصورة الأهلية
كلية تكنولوجيا العلوم الصحية

توصيف المقرر

1. متطلبات الكلية الاجبارية (Obligatory Faculty Requirements)

Course code	**HST 101**
Course name	**English Language**
Credit hours	**(2): 2 L**
Course description	**The course will provide student with necessary skills regarding the different types of English writing and the way of writing text under the main specification free of spelling, grammar and verbatim errors, and proper use of punctuation. Report writing, abstract writing using accurate grammar & vocabulary are to be focused on**
Prerequisite	**-**

Course code	**HST 102**
Course name	**Medical Terminology**
Credit hours	**(2): 2 L**
Course description	**This course introduces the language needed for effective communication in healthcare. It covers the structure of medical terms, word-building rules, and terminology related to body structures. The course also focuses on terms used in medical procedures, pharmacology and disease states**
Prerequisite	**-**

Course code	**HST 103**
Course name	**Basic Physics**
Credit hours	**(2): 1 L + 1 T**
Course description	**This course will help students to understand physics principles applied to biological systems. Students will be able to improve function of biological system components depending on concepts of dimensions, heat, temperature, fluid, fluid dynamics, force, power, energy, sound, medical ultrasound, radiation, radiation and x-rays.**
Prerequisite	**-**

Course code	**HST 104**
Course name	**Mathematics**
Credit hours	**(2): 1 L + 1 T**
Course description	**This course will provide student with a review of fundamental operations in Mathematics. Topics include elementary algebra and functions, intermediate algebra and function, Applications of matrices in health sciences (e.g., population models, data organization), geometry and measurement, Integration and its applications (e.g., area under a curve, accumulation), Differential equations and their use in modeling biological systems, probability and random variables, and hypothesis testing**
Prerequisite	**-**

Course code	**HST 105**
Course name	**Basic Computer Skills**
Credit hours	**(2): 1 L + 1 P**
Course description	**This course will provide student with a brief introduction to the world of computers including: number systems and data representation, computer system components: hardware & software, storage and input/output systems, Operating systems and Utility Systems, software applications. Also it gives an overview about computer networks and internet: data communication, transmission modes, transmission media, computer networks and internet services. It practices some computer applications in the laboratory such as Internet Access, word processing, Excel and power point. It gives students basic of chat GPT; how it helps the student in search and developing projects related to the specialty.**
Prerequisite	**-**

Course code	**HST 106**
Course name	**Basic Biostatistics**
Credit hours	**(2): 1 L + 1 P**
Course description	**This course will provide student with information about types and sources of data, quantitative & qualitative, scales of measurements. Sampling (definition, types of sampling error and & summarization; list, tables, graphs &numerical methods). Descriptive statistics (The effect of constant changes on measures of central tendency, dispersion & confidence intervals). Application on Excel, SPSS & prism program**
Prerequisite	**-**

Course code	**HST 107**
Course name	**General Pharmacology**
Credit hours	**(3): 2 L + 1 P**
Course description	**This course will handle the basic principles of pharmacology suitable for technologist. Provide comprehensive coverage of the major drug groups affecting different body systems; autonomic nervous system, cardiovascular system and heam system, endocrine, central nervous system, respiratory system, gastrointestinal system, autacoids**
Prerequisite	**-**

Course code	**HST 108**
Course name	**General Anatomy and Histology For Technologists**
Credit hours	**(3): 2 L + 1 P**
Course description	**Anatomy** **The course introduces the student to the structure of body systems, namely integumentary, musculoskeletal, cardiovascular, lymphatic, and respiratory systems, nervous, endocrine, urinary, and reproductive systems. Anatomy of the eye, ear and nose is also included.** **Histology** **The course contents include cell structure, presentation of tissue, epithelial tissue, glandular epithelium, connective tissue, bone & bone marrow, cartilage, nervous and muscle tissues**
Prerequisite	**-**

Course code	**HST 109**
Course name	**General Physiology for Technologists**
Credit hours	**(3): 2 L + 1 P**
Course description	**This course will provide students with concepts of cellular, tissue and system hemostasis. Coverage on the integration of the different body systems to maintain body functions**
Prerequisite	**-**

Course code	**HST 110**
Course name	**General Microbiology**
Credit hours	**(3): 1 L + 1 P + 1 T**
Course description	**This course deals with general microbiology: bacteriology, virology and mycology. The course describes the structure, classification and growth of the microorganisms of medical importance and demonstrates the physical and chemical methods used to control growth of microorganisms. Practical sessions, also, include preparation of stains, all culture media and reagents for various microbiological tests.**
Prerequisite	**-**

Course code	**HST 111**
Course name	**General Chemistry**
Credit hours	**(3): 1 L + 1 P + 1 T**

Course description	**The course includes an introduction to the fundamental concepts of general chemistry (physical, organic inorganic and analytical chemistry). Focus areas include atomic structure, balancing equations, and stoichiometry of chemical reactions. Moreover, focus areas include intermolecular forces and molecular geometry, organic structure, chemical nomenclature, and basic chemical reactions. Besides, focusing on scientific measurements and various structure elucidation analysis methods.**
Prerequisite	**-**

Course code	**HST 112**
Course name	**Effective Communication and Presentation Skills**
Credit hours	**(2): 2 L**
Course description	**This course aims to fortify the necessary written and oral communication and presentation skills for students to improve inter- and intra-professional collaboration and communication with peers and others in different career paths. The course will also deal with the underlying attitudes, which form an interpersonal skill. It focuses on concept and meaning of communication; verbal and non verbal communication; active listening skills; communication styles and presentation skills. Additionally, this course describes effective personal branding, networking, and team building to succeed in recent work environment.**
Prerequisite	**-**

متطلبات الجامعة الاجبارية

(Obligatory University Requirements)

- **L (Lecture)**

Course code	**MNU 101**
Course name	**Research and Analysis Skills**
Credit hours	**(1): 1 L**
Course description	**The course will provide student with concepts in research. Types of knowledge sources. International aggregated databases. Different research methods, Surface web, deep web and dark web. Documentation software for research**

	sources. Ethics of scientific research. Plagiarism checking software. Open science and the consequent open access to knowledge
Prerequisite	**-**

Course code	**MNU 102**
Course name	**Social Issues**
Credit hours	**(1): 1 L**
Course description	**يتكون همقرر قضايا مجتمعية من قسمين: الجزء الأول (إلزامى) - ويحتوي على أربعة فصول على النحو التالي :** **الفصل الأول: متطلبات النمو السكاني وأثره على الصحة الإنجابية.** **الفصل الثاني: حقوق الإنسان.** **الفصل الثالث: الشفافية ومكافحة الفساد.** **الفصل الرابع: التسامح مع الأديان وآداب الحوار مع الآخرين** **الجزء الثانى (اختيارى) - ويتكون من فصلين** **:الفصل الخامس: التعليم الرقمي.** **.الفصل السادس: يحدده مجلس الجامعة.**
Prerequisite	**-**

Course code	**MNU 103**
Course name	**Law and Human Rights**
Credit hours	**(1): 1 L**

Course description	**حقوق الانسان من حيث خصائصها ومصادرها الدولية والوطنية، وأنواعها المختلفة، وأساسها في الشرائع السماوية، والكرامة الانسانية، والحق في الجنسية، وارتباط حقوق الانسان بالعولمة والتنمية بمختلف انواعها، وحقوق المرأة العاملة، وحقوق ذوي الاحتياجات الخاصة، ودور الدولة في حماية حقوق الإنسان على المستويين الدولي والمحلي.**
Prerequisite	**-**

Course code	**MNU 104**
Course name	**Professional Ethics and Morals**
Credit hours	**(1): 1 L**
Course description	**This course explores the ethical principles, professional responsibilities, and moral dilemmas faced by medical sciences technologists.** **Students will Learn the ethical foundations of healthcare, including confidentiality, patient autonomy, patient rights, informed consent, beneficence, non-maleficence, justice and the equitable distribution of healthcare resources. Emphasis is placed on understanding professional codes of conduct, legal obligations, cultural sensitivity, and the role of ethics in decision-making.**
Prerequisite	**-**

متطلبات الكلية الإختيارية

(Elective Faculty Requirements)

Course code	**HSTE 01**
Course name	**Health Coaching**
Credit hours	**(2): 1 L + 1 T**
Course description	**This course equips students with the knowledge and skills necessary to guide individuals and groups toward healthier lifestyles through personalized support, behavior change strategies, and goal setting. Students will learn evidence-based coaching techniques, communication skills, and approaches to foster motivation, accountability, and sustainable health behavior changes. The course emphasizes the integration of wellness principles, the role of a health coach, and strategies for addressing diverse health challenges, including nutrition, fitness, stress management, and chronic disease prevention**
Prerequisite	**-**

Course code	**HSTE 02**
Course name	**Basic Nutrition**
Credit hours	**(2): 1 L + 1 T**
Course description	**This course provides an introduction to the science of nutrition, focusing on the fundamental principles of how nutrients affect human health. Students will explore the biological functions of macronutrients (carbohydrates, proteins, and fats) and micronutrients (vitamins and minerals), dietary guidelines, and their relationship to health and disease prevention. The course also emphasizes the importance of balanced diets, nutritional requirements at different life stages, and the role of nutrition in promoting overall well-being.**
Prerequisite	**-**

Course code	**HSTE 03**
Course name	**Artificial Intelligence in Modern Healthcare Systems**
Credit hours	**(2): 1 L + 1 T**
Course description	**This course explores the transformative role of Artificial Intelligence (AI) in modern healthcare systems. It provides a comprehensive understanding of AI principles, applications, and challenges within the healthcare industry. The course covers foundational AI techniques, machine learning models, and their implementation in diagnostics, treatment, patient management, and operational efficiency. It emphasizes ethical considerations, data security, and regulatory compliance. By the end of the course, participants will be equipped to evaluate, design, and implement AI-driven solutions in healthcare settings.**
Prerequisite	**-**

Course code	**HSTE 04**
Course name	**Foodborne Diseases**
Credit hours	**(2): 1 L + 1 T**
Course description	**This course provides an in-depth exploration of foodborne diseases, focusing on their causes, prevention, and control. Students will learn about various pathogens, toxins, and contaminants that lead to foodborne illnesses and how they affect human health. The course emphasizes public health strategies, food safety protocols, and outbreak investigation methods to ensure food quality and safety in different settings.**
Prerequisite	**-**

Course code	**HSTE 05**
Course name	**Occupational Health**
Credit hours	**(2): 1 L + 1 T**
Course description	**This course provides an introduction to the principles and practices of occupational health, emphasizing the promotion of safe and healthy workplaces. It explores the identification, evaluation, and control of workplace hazards, as well as the roles of health professionals, employers, and workers in ensuring occupational safety. Topics include ergonomics, workplace safety standards, occupational diseases, and strategies for prevention and management. The course equips students with the knowledge and skills needed to address occupational health challenges in diverse work environments.**
Prerequisite	**-**

Course code	**HSTE 06**
Course name	**Principles of Marketing**
Credit hours	**(2): 1 L + 1 T**
Course description	**This course introduces the fundamental concepts, strategies, and practices in marketing. It provides an overview of the marketing process, including market research, consumer behavior, segmentation, targeting, and positioning. Students will learn about the marketing mix (product, price, place, promotion) and its role in developing effective marketing strategies. By the end of the course, participants will have a solid understanding of how to create value for customers and build long-term relationships in a competitive marketplace.**
Prerequisite	**-**

Course code	**HSTE 07**
Course name	**Scientific Writing**
Credit hours	**(2): 1 L + 1 T**
Course description	**This course is designed to equip students and professionals with the skills needed to effectively communicate scientific research and findings through written formats. It covers the principles of clear, concise, and structured scientific writing, with an emphasis on writing research papers, proposals, reviews, and reports. It covers methods of paraphrasing, common mistakes in scientific writing, different writing styles, how to write a scientific report, proposal and manuscript, appropriate use of tables and figures in data presentation and evaluation of literature and information sources. The course includes exercises to develop critical writing skills, understand scientific ethics, and navigate the publication process. The course enable students to have the confidence to produce high-quality scientific documents suitable for academic and professional contexts.**
Prerequisite	**-**

Course code	**HSTE 08**
Course name	**Complementary and Alternative Medicine**
Credit hours	**(2): 1 L + 1 T**
Course description	**This course provide students with information about the different herbal preparations, nutritional supplements, and homeopathies, herbal preparations that are widely used by the general public as self-selected OTC (over-the-counter) products/NPDs (nonprescription drugs). Also, the student should have information about food items for therapeutic, disease prevention or health promotion purposes.**
Prerequisite	**-**

Course code	**HSTE 09**
Course name	**Experimental Animal Model**
Credit hours	**(2): 1 L + 1 T**
Course description	**In this course student will identify laws and ethical regulatory frameworks for the handling of laboratory animals in Egypt. Identify how environmental factors and common infections among laboratory animals can influence experiment results, and give examples of areas of application. Apply different techniques for screening and bioassay of new drugs belongs to different pharmacological categories.**
Prerequisite	**-**

Course code	**HSTE 10**
Course name	**Entrepreneurship**
Credit hours	**(2): 1 L + 1 T**
Course description	**This course covers business acumen, team-building, industry-academia relationships, and ethical/regulatory principles. Emphasizes design thinking, interprofessional collaboration, and leadership in healthcare innovation. Students engage in hands-on activities, case studies work on real-world projects to develop and test innovative processes and products**
Prerequisite	**-**

2. متطلبات البرامج الاجبارية (Obligatory program Requirements)

course code	**SMIS 201**
Course name	**Biostatistics I**
Credit hours	**(3): 2 L+1 P**
Course description	**This course will provide the students to an essential guide to the distribution (normal distribution, binomial distribution, poisson distribution). Probability including probability distributions, discrete probability distributions. Health and disease measures (introduction, difference between ratios, rates, and proportions). Test of normality. Hypothesis testing (introduction, definitions, characteristics of a good hypothesis, the steps for choosing suitable testing hypotheses, type I /II errors, P value). Tests for differences (mean population & variances). Comparing the mean of a population with a fixed value (Standard scores/z-scores). Comparing the mean of two populations (Paired/unpaired t test). Application on excel, SPSS & prism program**
Prerequisite	**Basic Biostatistics (HST 106)**

Course code	**SMIS 202**
Course name	**Programming System I**
Credit hours	**(3): 2 L+1 P**
Course description	**This course provides the basics of programming using the C programming language. It starts with fundamental programming concepts, such as algorithms, flow control, and basic syntax common across languages. By moving forward, students will dive into the core features of C programming language, including data types, variables, operators, and how to control program flow using loops and conditionals. They will also learn to write functions, work with arrays and strings, and understand pointers for managing memory efficiently. The course covers advanced topics like structures, file handling, and debugging techniques, equipping students with the skills needed to develop real-world C programs. By the end, students will be able to build, test, and debug their own C projects.**

prerequisite	**-**

Course code	**SMIS 203**
Course name	**Microbiology for Medical Informatics Technologists**
Credit hours	**(3): 2 L+1 P**
Course description	**This course provides an overview of microbiology concepts relevant to health informatics, focusing on the role of microorganisms in human health and disease. Students will learn how microbiological data is collected, analyzed, and utilized in healthcare informatics systems to support clinical decision-making, disease surveillance, and patient care. Emphasis is placed on interpreting laboratory results, understanding pathogen-related data, Antimicrobial stewardship (using informatics to optimize antibiotic use) and integrating microbiological information into health informatics platforms.**
prerequisite	**General Microbiology (HST 110)**

Course code	**SMIS 204**
Course name	**Healthcare Environment**
Credit hours	**(1): 1 L**
Course description	**This course provides an overview of the various types of healthcare organizations, including public hospitals, private nonprofit hospitals, private for-profit hospitals, and physician-owned practices. We will explore different healthcare delivery settings such as hospitals, clinics, outpatient centers, ambulatory surgery centers, rehabilitation facilities, long-term care facilities, and home health care services. You will learn about healthcare regulations and standards, including HIPAA, the HITECH Act, and CMS regulations.**

prerequisite	**-**
Course code	**SMIS 205**
Course name	**Pharmacotherapy Informatics I**
Credit hours	**(3): 2 L+1 P**
Course description	**This course will introduce the student to practice the science of integrating pharmacotherapeutic information and knowledge with information technology to manage and integrate health information. To provide students with an understanding of contemporary pharmacotherapeutics with regards to disease management, selection and optimization of medicines in the following health discipline areas: neurology and psychiatry, hematology, oncology, gastrointestinal & respiratory disease with pharmacotherapeutic modalities will be addressed**
Prerequisite	**General pharmacology (HST 107)**

Course code	**SMIS 206**
Course name	**Biostatistics II**
Credit hours	**(2): 1 L+1 P**
Course description	**This course will provide the students to an essential guide for comparing more than two means of a population with analysis of variance (introduction, multiple t-tests or ANOVA, mechanism of ANOVA, commonly used types of ANOVA, assumptions for ANOVA). Comparing between variances using F-Test and different conditions for post hoc test. Comparing distributions (Chi-square for goodness of fit & Chi-square for independence, association and dependence of variables in contingency tables, Fisher's exact test for small samples, tests of homogeneity, Chi-squared test, McNemar's test for paired proportions). Application on excel, SPSS & prism program**
Prerequisite	**Biostatistics I (SMIS 201)**

Course code	**SMIS 207**
Course name	**Programming System II**
Credit hours	**(3): 2 L+1 P**
Course description	**This course introduces Python programming with a focus on Object-Oriented Programming (OOP) concepts and how Python efficiently manages and processes data. Students will start by learning the basics of Python syntax, including variables, data types, and control structures. As the course progresses, students will dive deeper into OOP concepts such as classes, objects, inheritance, polymorphism, and encapsulation. Special attention will be given to how OOP serves to organize and manipulate data effectively. The course will also cover Python's powerful data structures like lists, dictionaries, and sets, along with file handling and working with external data sources such as databases and APIs. By the end of the course, students will be able to design, build, and manage Python applications that utilize OOP principles for real-world data processing tasks.**
prerequisite	**-**

Course code	**SMIS 208**
Course name	**Database Entry System**
Credit hours	**(3): 2 L+1 P**
Course description	**This course is intended to prepare students to know the Database systems theoretically. Focusing on relational database by studying its benefits and the basics that have been used and its programming way using Structured Query Language (SQL). Preparing the students to build database system using Microsoft access which is used and applied by the students in the lab. Knowing a working database system using one of the popular commercial DBMS such as Microsoft Access. The course introduces students to the concepts of databases and database modeling design. In the first stage students will build a conceptual data model that is independent of all physical considerations. They will then transform this model in the second stage into relational database logical model. In the third stage, students will translate the logical data model into physical design for the target DBMS. The topics covered by this course are: Basic concepts of databases, the concepts of the relational database, conceptual data modelling using ERD, data normalization and the concepts of query-by example. The practical use of a commercial database management system to build a small application.**
Prerequisite	**Programming system I (SMIS 202)**

Course code	**SMIS 209**
Course name	**Pharmacotherapy Informatics II**
Credit hours	**(3): 2 L+1 P**
Course description	**This course will handle a subset of health informatics; leverages both clinical expertise and knowledge about information technology to improve medication management processes and drug administration safety and integrate health information. To provide students with an understanding of contemporary pharmacotherapeutics with regards to disease management, selection and optimization of medicines in the following health discipline areas: cardiovascular, musculoskeletal, renal, endocrine disease; addiction disorders. For each of these discipline areas, specific conditions managed with pharmacotherapeutic modalities will be addressed**
Prerequisite	**General Pharmacology (HST 107)**

Course code	**SMIS 210**
Course name	**Drug and Toxin Informatics**
Credit hours	**(2): 1 L+1 P**
Course description	**This course will deal with pharmacovigilance drug information and poison information centers especially Egyptian pharmacovigilance center and principal drug interaction as well. All activities relating to the detection, assessment, understanding and prevention of adverse effects or any other medicine-related problem. Measure, and compare the costs, risks, and benefits of programs, services, or therapies and determining which alternative produces the best health outcome for the resource invested. Classify of study design & clinical trials**
Prerequisite	**-**
Course code	**SMIS 301**

Course name	**Biostatistics III**
Credit hours	**(2): 1 L+1 P**
Course description	**This course will deal with non-parametric testing (Sign test, Wilcoxon test, Kruskal-Wallis test & Rank correlation). Correlation and regression (introduction, correlation, Pearson correlation coefficient, The Spearman Rank correlation coefficient, Kendall's Rank correlation coefficient, Point-Biserial correlation, Partial correlation coefficient, comparing two correlation coefficients, regression & assumptions for linear regression, confidence interval and significant test for regression coefficient, coefficient of determination.**
Prerequisite	**-**

Course code	**SMIS 302**
Course name	**Toxicology and First Aid**
Credit hours	**(3): 2 L+1 T**
Course description	**This course enables the students to know general principles of toxicology, supportive measures, therapeutic interventions, specific antidotes as general guidelines of treatment modalities. How to deal with medical emergency based on the different courses. This course also includes introduction, accidents, first aid of ABCs, medical emergencies, effect of temperature, respiratory emergencies, fractures and dislocations, bleeding and surgical emergencies, burns, animal bites or stings and poisoning.**
Prerequisite	**-**

Course code	**SMIS 303**
Course name	**Web Technology**

Credit hours	**(3): 2 L+1 P**
Course description	**This course offers a thorough exploration of web development, covering both front-end and back-end technologies. Students will start with front-end development, learning how to create well-structured and visually appealing web pages using HTML, style them with CSS, and enhance interactivity with JavaScript. The course will then transit to back-end development, where students will discover how to build server-side applications, manage databases, and handle server-client communication. Topics include server-side scripting with Node.js, database management, RESTful APIs, and integrating front-end and back-end technologies. The course will also cover best practices for web development, including responsive design, performance optimization, and security. By the end of the course, students will be equipped to build and deploy full-stack web applications, combining effective user interfaces with robust server-side functionality.**
Prerequisite	**Programming System I (SMIS 202)**

Course code	**SMIS 304**
Course name	**Infection Control Informatics**
Credit hours	**(3): 2 L+1 P**
Course description	**Provide forum for students to exchange their views on Infection control informatics that transcends healthcare settings, technology vendors, and technology configuration. This course provides students with an opportunity to advance knowledge and skills in infection prevention and control in contemporary healthcare practice. Students will be encouraged to explore aspects of clinical governance, prevention of infection and outbreak/exposure management, with particular relevance to the student's specialist clinical practice. Provide infection preventionists with a place to expand their understanding of surveillance technologies used within the infection prevention arena. Bring attention to common surveillance technology issues. Discuss data validation techniques. Track progress of agency proposals to use reporting data directly from electronic medical records. Discuss ways to mitigate potential impacts of changes in data reporting formats**
Prerequisite	**Microbiology for Medical informatics Technologists (SMIS 203)**

Course code	**SMIS 305**
Course name	**Health Informatics I**

Credit hours	**(3): 2 L+1 P**
Course description	**This course will deal with introduction to health informatics. Health informatics vs health information management. Types of health informatics, benefits of healthcare informatics, application of health informatics, legislation of health informatics. Clinical significance of health informatics and how does health informatics improve the quality and delivery of health care. What do health informatics professionals do. Health informatics job titles. Health informatics professionals work areas. Patients as a central core of health informatics. Health informatics and health care system. Health informatics sub-disciplines. Roles and responsibilities of a health informatics specialist. Healthcare data management; In-depth exploration of data collection, storage, and retrieval processes. Focus on data governance and quality assurance to ensure the reliability and accuracy of health data. Introduction to data privacy & security Ethics. Introduction to health data vocabularies and standards; Students are introduced to various standardized clinical terminologies, healthcare information standards, and data sets required for state and federal reporting and for electronic standards needed to attain interoperability. Emphasis is on developing expertise in identifying their appropriate sources and uses and applying them within and among health information systems to promote interoperability. Students will apply knowledge discovery, documentation, and sharing. This course integrates key issues and techniques of technical infrastructure and data architecture in clinical informatics and the role of standards and ontologies in health care.**
Prerequisite	**Database Entry System (SMIS 208)**

Course code	**SMIS 306**
Course name	**System Analysis and Design**
Credit hours	**(3): 2 L+1 P**

Course description	**This course will prepare student to investigate information systems with respect to their existence and identification and development of needed informational improvements within an organization. Recommended methods and procedures considering computer involvement are reviewed, designed and implemented using the case-study approach. System analysis fundamentals. Information requirements analysis. The analysis process. The essentials of design. Software engineering and implementation. This course will also introduce students to computer programming with a focus on the phases of the systems development life cycle. Students will develop the knowledge and skills needed to be able to evaluate and produce systems design to build software systems for business and analytical information management purposes and to explore human factors, consumer informatics, principles and the application of usability assessments for the development and use of health information technology by clinicians and patients. This includes the ability to apply the basic theoretical and conceptual foundations in systems design and software development such as systems analysis and design, methodologies, techniques, and tools. This course will introduce students to the appropriate uses of analytics and its limitations and define how to approach the various stakeholders within an organization with analytic information. Included will be a review of the ethical, regulatory, and compliance issues related to a given business problem and/or solution. Interpretation of performance-based organizational issues while concurrently identifying solutions for these same performance-based organizational issues. In addition, time will be spent identifying best practices to plan for engaging, implementing, and sustaining organizational change**
Prerequisite	**-**

Course code	**SMIS 307**
Course name	**Decision Support System**
Credit hours	**(3): 2 L+1 P**

Course description	**This course introduces statistical models as they are used in predictive analytics. It addresses issues of statistical model specification and model selection, as well as best practices in developing models for management. Students learn to apply statistical techniques to the processing and interpretation of data from various industries and disciplines. Information overload, clinical support decision. Decision analysis with an emphasis on medical decision-making and elements of human cognition under uncertainty. Students become familiar with the graphical display of medical information, decision analysis and modeling, evidence-based medicine, Bayes' theorem, knowledge-based systems, learning systems, lexicons, coding and structured data entry, and data mining techniques.**
Prerequisite	**-**

Course code	**SMIS 308**
Course name	**Information Technology Policies and Security**
Credit hours	**(3): 2 L+1 P**
Course description	**The growth of computer and communication technologies encourages the examination of policy issues related to electronic-based health information technologies. The course will focus on guiding principles for health informatics including privacy, security, interoperability, health information exchange and compliance-related issues. The establishment of institutional policies as well as regulatory and related concerns will be addressed. Administrative interpretation and implementation of information policy will be discussed. Current legislative and public policy initiatives will be investigated**
Prerequisite	**Health Informatics I (SMIS 305)**

Course code	**SMIS 309**
Course name	**Public Health Informatics**
Credit hours	**(3): 2 L+1 P**

Course description	**This course will handle the systematic application of information and computer science and technology to public health practice, research, and learning. This course provides a broad overview of the field, taking account of classic public health information delivery, core principles of epidemiology, health inequalities and health behavior change, as well as the implications of massive linked datasets for research and policy, and the value of emerging mobile and social technologies for health surveillance. It will discuss the issues from an international perspective, with reference to global public health needs and the emergence of innovative digital systems and analytics. The course introduces students to the history of public health, the structure of the public health system, and the various sectors of public health practice, in order to gain an understanding of the complex factors that determine the health status of a community. This course will draw from the public health field, but also related disciplines such as behavioral sciences, health care management, medical ethics, and social work. National, state, and local level practices will be analyzed, as well as the role that law and government play in the public's health.**
Prerequisite	**-**

Course code	**SMIS 310**
Course name	**Health Informatics II**
Credit hours	**(3): 2 L+1 P**
Course description	**This course will introduce healthcare data analytics; introduction to different types of health data analytics: descriptive, predictive, and prescriptive. Techniques for data visualization, crucial for interpreting and presenting healthcare data. Big Data in Healthcare; the concepts of big data and its applications within the healthcare industry. Overview of the tools and technologies used to manage large volumes of healthcare data. Healthcare information systems; detailed examination of electronic health records (EHRst), health information systems (HIS), and their interoperability. Introduction to coding and billing software, understanding how it integrates with other health IT systems. Data-driven decision making; analysis of how coded data is used in healthcare analytics to inform clinical and administrative decisions. Case studies demonstrating the impact of data analytics on healthcare outcomes. Regulatory and compliance issues; understanding compliance requirements in healthcare, particularly in data management. Focus on auditing and monitoring the use of health data to ensure compliance with regulations.**
Prerequisite	**Health Informatics I (SMIS 305)**

Course code	**SMIS 311**
Course name	**Field Training for Medical Informatics Technologist I**
Credit hours	**(2): 2 F**

Course description	**Field Training I is a hands-on, supervised practical experience designed to immerse students in real-world environments within the field of medical informatics. This course provides students with the opportunity to apply theoretical knowledge and technical skills acquired in their coursework to solve practical challenges in healthcare settings. During the training, students will engage in tasks related to health information systems, data management, and IT solutions for clinical and administrative workflows. Emphasis is placed on developing professional competencies, including teamwork, problem-solving, and effective communication with healthcare professionals.**
Prerequisite	-

Course code	**SMIS 401**
Course name	**Data Standards, Medical Coding and Billing**
Credit hours	**(3): 2 L+1 P**
Course description	**This course will introduce Code Foundations, learn how to code, learn programming fundamentals that can be helpful for any language student learn. Explore the history, concepts, and applications of Computer Science through a series of interactive videos, lessons, and articles. Learn about what makes up Data Science. International Classification of Diseases (ICD) serves a broad range of uses globally and provides critical knowledge on the extent, causes and consequences of human disease and death worldwide via data that is reported and coded with the ICD. Introduction to Medical Coding Learn the history and development of the various coding systems and identify the code types. Private Insurance & Managed Care Programs. How managed care programs work, including an overview of HMOs, PPOs, POS plans and PPGs. Medicaid, CHIP & Medicare Learn about how government programs like Medicaid, Medicare, Medigap and CHIP impact medical billing. Military Insurance, Workers' Compensation & COBRA Apply steps to file claims in special insurance situations like TRICARE, CHAMPVA and workers' compensation and COBRA. Determining Payment Determine provider reimbursement using UCR standards, fee schedules and relative value studies. Introducing the CMS-1500 Claim Form Detailed explanations help you complete the fields of the CMS-1500 insurance claim form. Explanation of benefits learns to read and interpret the explanations of benefits. Secondary claims Prepare secondary claims and handle insurance logs. Preparing the UB-04 Claim Form Detailed instructions and examples help you complete the fields of this form that hospitals primarily use. Insurance Follow-up and Preparing the CMS-1500 Hands-on practice completing the form for various carriers. Medical Billing Technology See how healthcare professionals use clearinghouses.**
Prerequisite	**-**
Course code	**SMIS 402**

Course name	**Consumer Health Informatics**
Credit hours	**(3): 2 L+1 P**
Course description	**In this course, we will introduce student to the emerging practice area of consumer eHealth, the aim of which is to empower consumers to better manage and influence their health and wellness, access healthcare services, and improve interactions with their caregivers by leveraging digital health solutions and services. Topics include solutions that emphasize the consumer experience (CX), new consumer access models and modalities, consumer-oriented technologies and systems such as APPs and health and wellness devices and platforms, HIPAA-compliant cloud-based services, the use of innovative wearables (i.e., electronic tattoos), internables/ingestibles and consumables, and behavioral management solutions such a Digiceuticals and PHRs.**
Prerequisite	**-**

Course code	**SMIS 403**
Course name	**Health Care and Telemedicine**
Credit hours	**(3): 2 L+1 P**
Course description	**This course provides students with description and analysis of the role of information and communications technologies in enabling remote patient care, health professional collaboration at a distance, and in supporting patient-self management. This is considered with reference to technological, clinical, sociological and policy perspectives. Non-communicable diseases and global health challenges are core themes. This course provides students with a detailed examination of the use of telehealth processes to transform the provision of healthcare. Through the context of professionalism and changing models of care, student will explore clinical, research and educational initiatives. Residents will learn the history and status of telehealth activities; engage with live telehealth learning experiences; understand the use of telehealth to improve healthcare access and population health; explore how team-based and academic/community partnerships can be used to advance care; and embrace the changing models of care resulting from advancing telehealth technologies.**
Prerequisite	**-**
Course code	**SMIS 404**
Course name	**Health Care Analyte Leadership**

Credit hours	**(2): 2 L**
Course description	**This course introduces best practices in leading change and project management, including: stakeholder engagement, project chartering, scope definition, and key metric development. Students will use these methods and models to demonstrate their understanding and ability to improve project definition and structure. Students should able to execute projects more effectively in their organizations. The course will also focus on developing effective communication and presentation skills to translate analytics to actionable recommendations that can be used to solve problems in their organizations. Through case scenario exercises, students will deepen their ability to present data analyses and recommendations in a clear and concise manner, evaluate analyses others have done, and articulate the strengths and limitations of their analyses. Students will demonstrate success if they are able to connect and translate their analytics to purpose, process, and people.**
Prerequisite	**-**

Course code	**SMIS 405**
Course name	**Health Informatics III**
Credit hours	**(3): 2 L+1 P**
Course description	**This course focuses on advanced topics and applications in health informatics, preparing students for research and practical applications in the field. The key topics include: Advanced health IT systems; In-depth study of clinical decision support systems (CDSS), EHR optimization, and clinical workflows. Integration of advanced technologies, such as AI, into health IT systems. Telemedicine and Mobile Health (mHealth); Advanced concepts in telehealth, including remote patient monitoring. Exploration of mobile health applications and wearable technology in healthcare. Artificial Intelligence and Machine Learning in Healthcare; Applications of AI and machine learning in areas like diagnostics, treatment planning, and personalized medicine. The ethical and practical challenges in implementing AI in healthcare.**
Prerequisite	**Health Informatics II (SMIS 310)**
Course code	**SMIS 406**
Course name	**Health Care Financial Management**
Credit hours	**(1): 1 L**

Course description	**This course introduces the field of data science, which combines business strategy, information technology, and modeling methods. The course reviews the benefits and opportunities of data science, as well as organizational, implementation, and ethical issues. The course provides an overview of modeling methods, analytics software, and information systems. It discusses business problems and solutions for traditional and contemporary data management systems, and the selection of appropriate tools for data collection and analysis. The course also reviews approaches to business research, sampling, and survey design**
Prerequisite	**-**

Course code	**SMIS 407**
Course name	**Advanced Health Informatics**
Credit hours	**(3): 2 L+1 P**
Course description	**This course focuses on precision medicine and genomics; understanding the role of health informatics in precision medicine, focusing on how genomic data is utilized in personalized healthcare. Health informatics research methods; introduction to research methods specific to health informatics. Guidance on designing, conducting, and analyzing research studies in the field. Future directions in health informatics; Exploration of emerging trends and future challenges in health informatics. Case studies showcasing successful implementation of health informatics projects. Nursing health informatics; the integration of nursing science, computer science, and information science to manage and communicate data, information, knowledge, and wisdom in nursing practice. Capstone Project; A comprehensive project that integrates knowledge from the previous courses, where students work on real-world problems or research topics in health informatics.**
Prerequisite	**-**
Course code	**SMIS 408**
Course name	**Health Care Education and Promotions**
Credit hours	**(2): 1 L+1T**

Course description	**This course aims to raise awareness about the importance of health promotion, a key public health strategy for improving health, well-being and equity. Review the pillars of health promotion adapted to meet the current challenges of the 21st century. Disseminate and socialize the strategic lines of action prioritized by the countries in the current regional framework for Health Promotion. To contribute to consolidate a more holistic, social and positive vision of health and well-being. To strengthen health promotion capacity at the local, national, and subnational levels with the aim of improving health, well-being and health equity in the Egyptians. To describe how health promotion concepts, tools and perspectives can be used and integrated into the daily work of the health sector and other sectors whose policies have an impact on health**
Prerequisite	-

Course code	**SMIS 409**
Course name	**Health Care Policies, Law, Ethics and Global Health Care Management System**
Credit hours	**(2): 2 L**
Course description	**This course explores the intersection of compelling legal, ethical, and social facets that impact the health care enterprise. The content, research, and group discussions support informaticists in building knowledge they need to navigate competing interests, underlying ethical principles, and key regulatory requirements. The course integrates changing financing paradigms, reimagined health care services delivery systems, the tension between precision medicine and population health, and evolving consumer expectations in the digital age. The challenges of safeguarding individual privacy rights and data security are assessed, along with the promise of innovative public-private partnerships that are shaping health informatics in the Learning Health Care System.** **This course also covers concepts and principles of law found in the healthcare field. The course focuses on legal issues regarding health information, including confidentiality, release of health information, consent forms, liability of healthcare providers, concepts and methods of risk management in the healthcare field, and other current medical/legal issues. Introduction to the concepts of medical law and ethics for health care practitioners. Topics including criminal and civil acts, contracts, negligence, and ethical concepts as they relate to the medical profession will be covered. Managed care, HIPAA, and other health care legislative rulings are discussed.**
Prerequisite	**-**

Course code	**SMIS 410**
Course name	**Graduation Project for Medical Informatics Technologist**
Credit hours	**(4): 4 GP**
Course description	**Students will choose a research point of interest to do some practical work with application of data analysis and writing a dissertation. Research projects in the field of Medical Informatics will be carried out by students under the guidance and supervision of faculty members. Projects will be evaluated by graduation project committee that will be assigned by academic Council, including oral presentation and discussion of the dissertation.**
Prerequisite	**-**

Course code	**SMIS 411**
Course name	**Field Training for Medical Informatics Technologist II**
Credit hours	**(2): 2 F**
Course description	**Field Training II is a capstone, in-depth practical experience designed to prepare students for practice in the field of medical informatics. This course builds on foundational training and provides students with the opportunity to lead, innovate, and apply advanced knowledge in health informatics within real-world healthcare settings. Students will engage in complex projects, including the design, optimization, and management of health IT systems, data analysis for decision-making, and strategic implementation of informatics tools to improve healthcare outcomes. The course emphasizes leadership, critical thinking, and advanced technical skills to meet the challenges of modern healthcare environments.**
Prerequisite	**Field Training for Medical Informatics Technologist I (SMIS 311)**