

6.4. Core Courses Level 300

GTA305/3- Advanced Hearing Amplification Technology

This course introduces students to the electroacoustic measurement, compression system, directional microphone, innovative signal processing schemes, prescription and outcome measurement of hearing aids, and special issues in hearing aids for children and adults. It also covers the assistive listening devices (ALDs), contralateral routing of signal (CROS), bone conduction hearing aids, bone anchored hearing aids (BAHA), cochlear implant, middle ear implant, and auditory brainstem implant. Physiology, components, medical and surgical aspects, selection of candidates, programming, rehabilitation, outcome and predictive factors cochlear implants are also emphasised. This course will be taught via lectures, tutorials, practical and problem-based learning (PBL). Students will be assessed through test, assignment, practical report and final examination.

List of text/reference books:

1. Katz, J., Burkard, R., Hood, L., & Medwetsky, L., *Handbook of Clinical Audiology*. Philadelphia: Lippincott Williams & Wilkins, 2009.
2. Stach, B.A., *Clinical Audiology: An Introduction* (2nd Ed.). San Diego: Singular Publishing Group, Inc., 2010.
3. Roeser, R.J., Valente, M., & Hosford-Dunn, H., *Audiology: Diagnosis, Treatment, Practice Management Volumes I-III* (2nd Ed.). New York: Thieme Medical Publishers, 2008.
4. Goldfarb, R., & Serpanos, Y.C., *Professional Writing in Speech-Language Pathology and Audiology Workbook*. San Diego: Plural Publishing Inc., 2011.
5. Liptak, J.J., Leutenberg, E., Sippola, C., Brodsky, A.L., & LISW, *The Communication Skills Workbook*. USA: Whole Person Associates, Inc., 2008.

GTA307/3-Audiology Clinic II

This course is a continuation from Audiology Clinic I. In this course, students are attached to Audiology Clinic of HUSM for two days clinic per week and supervised via experienced Audiologists for 14 weeks. This clinical training will cover the best practice of Audiology for both adult and pediatric cases including interviewing session for history taking, fundamental tests such as otoscopic examination, tympanometry, acoustic reflex and pure tone audiometry (with and without masking). This course is taught through clinical supervision and discussions. Students will be assessed through supervisor's evaluation (practical), report, presentation, test (clinical quiz), practical test (OSCE) and log book.

List of text/reference books:

1. Katz, J., Burkard, R., Hood, L., & Medwetsky, L., *Handbook of Clinical Audiology*. Philadelphia: Lippincott Williams & Wilkins, 2009.
2. Stach, B.A., *Clinical Audiology: An Introduction* (2nd Ed.). San Diego: Singular Publishing Group, Inc., 2010.
3. Roeser, R.J., Valente, M., and Hosford-Dunn, H., *Audiology: Diagnosis, Treatment, Practice Management Volumes I-III* (2nd Ed.). New York: Thieme Medical Publishers, 2008.

4. Goldfarb, R., & Serpanos, Y.C., *Professional Writing in Speech-language Pathology and Audiology Workbook*. San Diego: Plural Publishing Inc., 2011.
5. Liptak, J.J., Leutenberg, E., Sippola, C., Brodsky, A.L., & LISW, *The Communication Skills Workbook*. United States of America: Whole Person Associates, Inc., 2008.

GTA308/2-Evaluation of Balance System

This course introduces students to the fundamental aspects of balance and vestibular system, related diseases and their pathophysiology, the importance of nystagmus in clinical diagnosis, neuro-otological and vestibular evaluations as well as the interdisciplinary management of patients with balance and vestibular disorders. This course also covers the relationship between the vestibular test results and the related ear pathologies. This course is taught via lectures, tutorials and practical sessions. Students will be assessed through tests, presentation, practical reports and final examination.

List of text/reference books:

1. Hamid M. & Sismanis A., *Medical Otology and Neurotology: A Clinical Guide to Auditory and Vestibular Disorders*. New York: Thieme, 2006.
2. Luxon, L.M., Furman, J.M., Martini A. & Stephens D., *Textbook of Audiological Medicine: Clinical Aspects of Hearing and Balance*. London: Martin Dunitz, 2003.
3. Furman J.M. & Cass S.P., *Vestibular Disorders: A Case-Study Approach*. New York: Oxford University Press, 2003.

GTA309/4-Audiology Clinic III

This course is a continuation from Audiology Clinic I and II. Students are attached to Audiology Clinic of HUSM for two days clinic per week and supervised via experienced Audiologists for 14 weeks. Apart from conducting history taking and fundamental audiological tests, students are also involved in prescribing, fitting and evaluating hearing aid performance as well as taking ear impression. Besides this, students are also trained in explaining test results and giving counseling to patients. This course is taught through clinical supervision and discussions. Students will be assessed through supervisor's evaluation (practical), report, presentation, test (clinical quiz), practical test (OSCE) and log book.

List of text/reference books:

1. Katz, J., Burkard, R., Hood, L., & Medwetsky, L., *Handbook of Clinical Audiology*. Philadelphia: Lippincott Williams & Wilkins, 2009.
2. Stach, B.A., *Clinical Audiology: An Introduction* (2nd Ed.). San Diego: Singular Publishing Group, Inc., 2010.
3. Roeser, R.J., Valente, M. & Hosford-Dunn, H., *Audiology: Diagnosis, Treatment, Practice Management Volumes I-III* (2nd Ed.). New York: Thieme Medical Publishers, 2008.
4. Goldfarb, R., & Serpanos, Y.C., *Professional Writing in Speech-language Pathology and Audiology Workbook*. San Diego: Plural Publishing Inc., 2011.

5. Liptak, J.J., Leutenberg, E., Sippola, C., Brodsky, A.L., & LISW, *The Communication Skills Workbook*. USA: Whole Person Associates, Inc., 2008.

GTA310/2-Basic Medical Management for Audiologist and Speech Pathologist

This course introduces students to the aspects of fundamental human anatomy and physiology and fundamental clinical examination that covers the respiratory, cardiovascular and neurology systems, and special senses (smell, vision and sensation). This course also introduces fundamental laboratory and radiological investigations and treatment options such as pharmacology, operation, physiotherapy and occupational therapy. This course also covers fundamental emergency procedures. This course will be taught via lectures, tutorials and practical sessions. The students will be assessed through test, practical exam (OSPE), practical reports and final examination.

List of text/reference books:

1. Herlihy, B.B., *The Human Body in Health and Illness* (3rd Ed.). Philadelphia: W.B. Saunders Company, 2006.
2. Marieb, E. N., *Anatomy & Physiology Coloring Workbook: A Complete Study Guide* (9th Ed.). San Francisco: Pearson Benjamin Cummings, 2008.
3. Sembulingam K. & Sembulingam P., *Essentials of Medical Physiology* (3rd Ed.). India: Jaypee Brothers Medical Publishers, 2004.
4. Tortora, G.J. & Derrickson, B.H., *Principles of Anatomy and Physiology* (12th Ed.). New York: John Wiley & Sons Inc., 2009.

GTA311/4-Audiological Rehabilitation

This course introduces students to the importance of audiological rehabilitation, interdisciplinary roles of the involved professionals, auditory and visual aspects in communication, psychosocial aspects of hearing loss, rehabilitation techniques for children and adults with hearing loss, tinnitus and vestibular disorders. It also covers important issues such as the effects of hearing loss on language development and the communication modes for individuals with pre-lingual and post-lingual hearing loss. This course will be taught via lectures, tutorials and practical sessions. Students will be assessed through test, presentation, practical reports and final examination.

List of text/reference books:

1. Johnson, C.E., *Introduction to Auditory Rehabilitation: A Contemporary Issues Approach*. Allyn & Bacon, 2011.
2. Wolfe, J. & Schafer, E., *Programming Cochlear Implants (Core Clinical Concepts in Audiology)*. San Diego: Plural Publishing Inc., 2010.
3. Seewald, R. & Tharpe, A. M., *Comprehensive Handbook of Pediatric Audiology*. San Diego: Plural Publishing Inc., 2010
4. Herdman, S. J., *Vestibular Rehabilitation* (3rd Ed.). F.A. Davis Company, 2007.
5. Katz, J., Burkard, R., Hood, L., & Medwetsky, L., *Handbook of Clinical Audiology*. Philadelphia: Lippincott Williams & Wilkins, 2009.

GTB307/3-Medical Parasitology

This course covers the definitions, classifications and nomenclatures of protozoa and helminths that infect humans. In addition, focus will be on the theoretical and practical aspects of routine and molecular diagnosis of parasites that affects human health. The knowledge on morphology, life cycle, epidemiology, brief pathogenesis, prevention and control of protozoal and helminthic infections will be integrated during discussion sessions. Furthermore, identification keys such as unique characteristics of eggs, larvae and pupae in water environment; and the principles of controlling the four medically important genera of Malaysian mosquitoes will also be discussed. The final topic will cover the structure, function and administration of a typical parasitology laboratory. The course will be conducted via lecture, tutorial and practical. The students will be evaluated through tests, SPOT/OSPE (practical tests) and final examination.

List of text/reference books:

1. Bogitsh, B.J., Carter, C.E. & Oeltmann, T.N., *Human Parasitology* (3rd Ed.), San Diego: Elsevier Academic Press, 2005.
2. Halton, D.W., Behnke, J.M. & Marshall, I. (Eds.), *Practical Exercises in Parasitology*. Cambridge: University Press, 2001.
3. Hossain, M.A., *Medical Parasitology: Basic and Clinical* (2nd Ed.). Ittadi Book Center, Dakka, 2008.
4. Leventhal, R. & Cheadle, R.F., *Medical Parasitology: A Self-instructional Text* (5th Ed.). Philadelphia: FA. Davis Publishing Co., 2002.
5. Parija, S.C., *Textbook of Medical Parasitology* (3rd Ed.). New Delhi: All India Publishers & Distributors, 2006.
6. Palmer, S.R., Soulsby, L., Torgerson, P.R. & Brown, D.W.G. (Eds.), *Oxford Textbook of Zoonoses: Biology, Clinical Practice, and Public Health Control*. Oxford University Press, 2011.

GTB310/3-Clinical Biochemistry

This course covers the theory and pathophysiological biochemistry of the human body. Students will be exposed to the principles of biochemical tests in the laboratory and the interpretation of results from laboratory analyses. The students are also exposed to some skills in performing laboratory diagnostic procedures in chemical pathology such as liver function test, renal test, pancreas and gastrointestinal tract test and other major biochemical parameters, either using manual diagnostic procedures or automation. Quality control program and laboratory administration in chemical pathology laboratory including specimen receiving and processing will also be covered. The course will be conducted via lecture, practical and tutorial. The students will be evaluated through tests, practical reports, OSPE (practical tests) and final examination.

List of text/reference books:

1. Ahmed, N. *Clinical Biochemistry*. New York: Oxford University Press, 2011
2. Allan, G., Michael, J.M., Robert, A.C., Denis St. J.O., Michael, J.S. & James, S., *Clinical Biochemistry; An Illustrated Colour Text* (4th Ed.). Churchill Livingstone, Elsevier, 2008.

3. Harold, V., *Practical Clinical Biochemistry* (4th Ed.). New Delhi: CBS Publishers & Distributors Pvt. Ltd, 2005.
4. Lieberman, M., Marks, A.D. & Peet, A., *Marks' Basic Medical Biochemistry: A Clinical Approach* (4th Ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 2013.
5. Nancy A. Brunzel. *Fundamentals of Urine and Body Fluid Analysis* (3rd Ed.). Philadelphia: W.B. Saunders Company, 2012.
6. Swaminathan, R., *Handbook of Clinical Biochemistry* (2nd Ed.). New Jersey: World Scientific, 2011.
7. Nessar, A. (Ed), *Clinical Biochemistry: Fundamentals of Biomedical Science*. Oxford University Press. 2011.

GTB316/3-Transfusion Science and Blood Banking

This course introduces students to the concept and knowledge of transfusion science and blood banking. It covers topics of blood group, blood component, pretransfusion testing, laboratory management and complication of blood transfusion. The course will be conducted via integrated teaching and learning approach, which comprise of lectures, practicals, seminar, intellectual discussion or mini project especially regarding blood donation awareness in improving patient health and quality of life. The students will be continuously evaluated on theoretical knowledge, practical skills (SPOT/OSPE), presentation on health sustainability and final examination. At the end of the course, the students will be equipped with the concepts and knowledge for the best practices in discipline of clinical and transfusion science.

List of text/reference books:

1. Blaney, K.D. & Howard, P.R., *Basic and Applied Concepts of Blood Banking and Transfusion Practices* (3rd Ed.). Elsevier Saunders, 2012.
2. Gretchen, J., Zundel, W. & Gockel-Blessing, E., *Clinical Laboratory Blood Banking and Transfusion Medicine Practices*. Pearson 2014.
3. Harmening, D.M., *Modern Blood Banking and Transfusion Practices* (6th Ed.). F.A. Davis Company, 2012.
4. Knight, R., *Transfusion and Transplant Science (Fundamentals of Biomedical Science)*. Oxford University Press, 2013.
5. Quinley E. D., *Immunohematology: Principles and Practice* (3rd Ed.). Lippincott Williams & Wilkins, 2010.
6. Roback, J.D. (Ed.), *Technical Manual, American Association of Blood Bank* (16th Ed.). American Association of Blood Banks (AABB), 2008.
7. Rudmann, S.V., *Textbook of Blood Banking and Transfusion Medicine* (2nd Ed.). NY: Elsevier Science, 2005.

GTB317/3-Clinical and Laboratory Haematology

This course introduces students to the concept and knowledge of clinical and laboratory haematology. It covers topics on haematological diseases, laboratory investigations, laboratory management and instrumentations. The course will be conducted via integrated teaching and learning approach, which comprise of lectures, practicals, seminar, intellectual discussion or mini project regarding health awareness especially in haematological diseases. The students will be continuously evaluated on theoretical knowledge, practical skills (SPOT/OSPE), presentation on health sustainability and final examination. At the end of the course, the students will be equipped with the concepts and knowledge for the best practices in discipline of clinical and laboratory haematology.

List of text/reference books:

1. Bain, B.J., Bates, I., Laffan, M.A. & Lewis S.M., *Dacie and Lewis Practical Haematology* (11th Ed.). Churchill Livingstone Elsevier, 2012.
2. Harmening, D.M., *Clinical Hematology and Fundamentals of Hemostasis* (5th Ed.). Philadelphia: F.A. Davis Co., 2008.
3. Hoffbrand, A.V. & Moss, P.A.H., *Essential Haematology* (6th Ed). Wiley-Blackwell, 2011.
4. Hoffbrand, A.V., Catovsky, D., Tuddenham, E.G.D., & Green, A.R., *Postgraduate Haematology* (6th Ed.). Wiley-Blackwell, 2010.
5. Lewis, S.M., Bain, B.J. & Bates, I., *Dacie and Lewis Practical Haematology* (10th Ed.). Philadelphia: Elsevier Science, 2007.
6. Moore, G., Knight, G. & Blann, A., *Haematology (Fundamentals of Biomedical Science)*. Oxford University Press, 2010
7. Rodak, B.F., Fritsma, G.A. & Koehane, E.M., *Hematology-Clinical Principles and Applications* (4th Ed.). Elsevier, 2011.
8. Simmons A., *Hematology- A Combined Theoretical and Technical Approach* (2nd Ed.). Butterworth Heinemann, 1996.

GTB318/3-Pharmacology II

This course introduces students to the concept of advance pharmacology and application in health. It covers pharmacokinetic, pharmacodynamic, pharmacogenetic, quantitative pharmacology, systemic pharmacology and an introduction to pharmacology research. The course will be conducted via lecture, practical, discussions and field trip with Pharmacy Enforcement. The students will be evaluated through tests, assignment, practical reports, presentation and final examination.

List of text/reference books:

1. Craig, C.R. & Stitzel, R.E. (Eds.), *Modern Pharmacology with Clinical Applications* (6th Ed.). NY: Little Brown & Co., 2003.
2. Katzung, B.G Masters S.B., *Basic and Clinical Pharmacology* (13rd Ed.). NY: McGraw-Hill Co., 2015.
3. Rang & Dale., *Pharmacology* (8th Ed.). London: Churchill Livingstone, 2015.

4. Tripathi, K.D., *Essentials of Medical Pharmacology* (6th Ed.). India: Jaypee brothers Medical Publishers (P) Ltd., 2008.

GTB319/3-Toxicology

This course introduces students to the fundamental concept of toxicology. Students are given opportunity to acquire knowledge, experience and innovative ideas in order to improve their skills in health, research and quality of life. This course covers the quantitative aspects and kinetics including the effects of dose, effect and tissue responses to toxic agents, the excretion of toxic substances, toxic reaction compounds, toxic substances such as solvent, food additives, herbicides and pesticides, detergents and materials other materials, the size of the levels of toxicity testing, *in vitro* and *in vivo*, toxicokinetic, toxicity to target organs, particularly the human, carcinogen, mutagen, teratogen, the mechanism of toxicity, laboratory tests, an antidote, and treatment. The course will be conducted via lecture, practical and discussion. The students will be evaluated through tests, presentation and final examination.

List of text/reference books:

1. Dart, R.C., *Medical Toxicology* (3rd Ed.). Philadelphia: Lippincott Williams & Wilkins, 2003.
2. Hodgson, E., *A Textbook of Modern Toxicology* (3rd Ed.). NY: John Wiley and Sons, 2004.
3. Klaasen, C.D. *et al.*, *Casarett and Doull's Essential of Toxicology*. USA: McGraw Hill Companies Inc., 2003.
4. Klaasen, C.D. *et al.*, *Casarett and Doull's Toxicology the Basic Science of Poison* (7th Ed.). USA: McGraw Hill Companies Inc., 2008.

GTB320/3-Medical Virology and Mycology

This course introduces students to the knowledge of virology and medical mycology that includes the type of disease caused by a virus and mycoplasma, reservoirs of infection and transmission of infection detrimental to the health and quality of life. It also includes laboratory diagnosis, type of treatment, and prevention of viral or mycoplasma infections. This course will be conducted through lectures, practical and seminar. Students will be assessed through tests, OSPE (practical test), presentation and final examination.

List of text/reference books:

1. Betty, A.F., Daniel, F.S. & Alice, S.W. *Bailey and Scott's Diagnostic Microbiology* (13th Ed.). San Diego: Elsevier Academic Press, 2013.
2. Borgers, M., Hay, R. & Rinaldi, M.G., *Current Topics in Medical Mycology (Vol. 4)*. German: Springer. 2011
3. Carter, J. & Saunders, V., *Virology: Principles and Applications* (2nd Ed.). USA: John Wiley & Sons, 2013.
4. Cheesbrough, M., *District Laboratory Practice in Tropical Countries, Part 1* (2nd Ed.). U.K: Cambridge University Press, 2010.

5. Geo, F.B., Karen, C.C., Janet, S.B. & Stephen, A.M., *Jawetz, Melnick and Adelberg's Medical Microbiology* (26th Ed.). USA: Mc Graw Hill, 2013.
6. Gerald, L.M., John, E.B. & Raphael, D., *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases* (8th Ed.). London: Churchill Livingstone, 2014.

GTB321/3-Clinical Diagnostic Laboratory Management

The course introduces students to the concept and knowledge of total quality management (TQM) in clinical diagnostic laboratory. TQM in clinical diagnostic laboratory emphasized the deployment of quality assurance principles and best practice through the development and implementation of quality assurance plans and phases. This course also covers topics on the concept of occupational health and safety, the quality systems, ISO 9001 and MS ISO 15189, in relation to the management of clinical diagnostic laboratory. The course will be conducted via blended learning approach, which comprise of lectures, seminars, online learning activities and management attachment in various clinical diagnostic laboratories. The students will be evaluated through online collaboration assignment, written test, electronic forum, seminar presentations and final examination.

List of text/reference books:

1. Carson, P.A. & Dent. N.J., *Good Clinical, Laboratory and Manufacturing Practices: Techniques for the QA Professional*. Cambridge: RSC Publication, 2007.
2. Cooper, G. & Gillions, T., *Producing Reliable Test Results in the Medical Laboratory*. Irvin, C.A.: Bio-Rad Laboratories, Inc., 2007.
3. Department of Standards Malaysia, *MS ISO 15189:2007. Medical Laboratories – Particular Requirements for Quality and Competence*. Cyberjaya: Department of Standards Malaysia, 2008.
4. International Standards Organization. *ISO 9001:2008. Quality Management Systems – Requirement* (4th Ed.), ISO, 2008.
5. Singer, D.C., Stefan, R. & Staden, J., *Laboratory Auditing for Quality and Regulatory Compliance*. NY: Taylor & Francis Group, 2005.

GTB322/3-Medical Bacteriology

This course covers the details knowledge of general characteristics of medically important bacteria. It covers fundamental aspects include effect of these organisms to human health, their role in the course of diseases, epidemiology, reservoirs, bacterial transmission, pathogenesis of diseases and clinical manifestations. The students will also be taught on appropriate clinical specimens collection and transportation techniques, the principle and processing techniques of laboratory detection, isolation and identification of pathogenic bacteria. Apart from that, student will acquire knowledge concerning on advantages and disadvantages of available laboratory techniques or tests (such as staining, culture, serological tests and molecular methods) used for bacterial detection. Prevention, control methods and treatment of the diseases caused by those bacteria are

also discussed. The course will be conducted via lecture, practical and tutorial. The students will be evaluated through tests, SPOT/OSPE (practical tests), presentation and final examination.

List of text/reference books:

1. Betty, A.F., Daniel, F.S. & Alice, S.W., *Bailey and Scott's Diagnostic Microbiology* (12th Ed.). San Diego: Elsevier Academic Press, 2007.
2. Cheesbrough, M., *District Laboratory Practice in Tropical Countries, Part 2* (2nd Ed.). U.K: Cambridge University Press, 2006.
3. Geo, F.B., Karen, C.C., Janet, S.B. & Stephen, A.M., *Jawetz, Melnick & Adelberg's Medical Microbiology* (24th Ed.). USA: Mc Graw Hill, 2007.
4. Gerald, L.M., John, E.B. & Raphael, D., *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases* (7th Ed.). London: Churchill Livingstone, 2010.
5. Maria, D.D., *Introduction to Diagnostic Microbiology*. Edinburgh: Mosby, 1997.

GTD311/3-Principles of Medical Nutrition Therapy I

This course explains the rationale of modifying normal diet to therapeutic diet in terms of nutrient composition, texture and presentation. It enables students to understand the importance of therapeutic diet in the prevention and treatment of various diseases in order to ensure sustainability of good health. Topics include dietary management of gastrointestinal diseases, cardiovascular diseases, diabetes, inborn errors of metabolism, body weight control, eating disorders, failure to thrive, food allergy, food intolerance and rehabilitation. The application of food exchange lists and various dietary guidelines will also be discussed.

List of text/reference books:

1. Thomas, B. and Bishop, T., *Manual of Dietetic Practices (The British Dietetic Association)*. Oxford: Blackwell Scientific, 2008.
2. Nelson, J., *Mayo Clinic Diet Manual* (8th Ed.). Elsevier Science, 2003.
3. Mahan, L.K and Escott-Stump, S., *Krause's Food, Nutrition and Diet Therapy* (12th Ed.). Saunders Co., 2007.

GTD321/3-Therapeutic Diet Preparation

This course gives practical training in the methods of therapeutic diet preparation for various disease conditions. Usage of foods for meal preparation and the minimisation of food wastage will be discussed during diet preparation. Purchase of raw materials, calculation of the nutrient contents in a prepared food item, preparation methods, food serving and sensory evaluation will be emphasised. Lectures on therapeutic diet preparation knowledge and protocols will be given before the practical session. Assessment will be based on the students' ability in selecting/purchasing raw materials, nutrient calculations, demonstration of food serving, innovative and cultural-based dietary modification and sensory evaluation.

List of text/reference books:

1. Nelson, J., *Mayo Clinic Diet Manual* (8th Ed.). Elsevier Science, 2003.
2. Thomas, B. and Bishop, T., *Manual of Dietetic Practices (The British Dietetic Association)*. Oxford: Blackwell Scientific, 2008.
3. Alpers, D.H., Stenson, W.F. & Bier D.M., *Manual of Nutritional Therapeutics* (5th Ed.). Lippincott Williams & Wilkins, 2008.

GTD323/3-Principles of Medical Nutrition Therapy II

This course is a continuation of Principles of Diet Therapy I. This course will discuss fundamental nutrition knowledge, principles and dietary management including the physiological and biochemical changes that occur during renal diseases, hepatobiliary diseases, cancer, skeletal and muscle diseases, pre and post operation conditions, trauma and burns. This course also deals with pediatric nutrition, total enteral and parenteral nutritions. Each topic will discuss about the theoretical and practical aspects of medical nutrition therapy that has to be given to the patients which includes assessment, planning, implementation, evaluation and documentation of the nutritional care processes.

List of text/reference books:

1. Thomas, B. & Bishop, T., *Manual of Dietetic Practices (The British Dietetic Association)*. Oxford: Blackwell Scientific, 2008.
2. Nelson, J., *Mayo Clinic Diet Manual* (8th Ed.). Elsevier Science, 2003.
3. Mahan, L.K. & Escott-Stump S., *Krause's Food, Nutrition and Diet Therapy* (12th Ed.). Saunders Co., 2007.

GTD324/3-Outpatient Dietetics Practicum I

This course exposes students to practicals involving the handling of cases in the outpatient clinics. Students are expected to be able to integrate theoretical diet therapy knowledge into best practice and understand that diseased condition can be improved by nutritional intervention. Students will also be taught on how to change patients' nutritional habit by using counselling techniques and history of prevalence. It is expected that this internship will effectively improve their skills required for nutritional counselling sessions.

List of text/reference books:

1. Alpers, D.H., Stenson, W.F. & Bier, D.M., *Manual of Nutritional Therapeutics* (5th Ed.). Lippincott Williams & Wilkins, 2008.
2. Rolfes, S.R., Pinna, K., Whitney, E., *Understanding Normal and Clinical Nutrition*, (9th Ed.). USA: Wadsworth/ Cengage Learning, 2012.
3. Mahan, L.K. & Escott-Stump, S., *Krause's Food, Nutrition and Diet Therapy* (12th Ed.). Saunders Co., 2007.

GTD325/3-Dietetics Practicum in the Ward I

This course provides clinical training to the students with the intention of enhancing their dietetic skills while giving medical nutrition therapy to the patients in hospital wards to improve their quality of life and promote sustainability of health. This internship programme covers individual patient approach, bed side counseling, nutrient intake analysis and therapeutic diet planning according to patients' dietary requirements based on diagnosis and medical report. Activities such as assessment of nutritional status and diet surveillance are also included. The students are required to give diet education to patients and their families. The students will understand the role and importance of dietitians in an interdisciplinary healthcare team. Upon completion of this courses the students are expected to submit case reports and to give case presentation of their respective case studies.

List of text/reference books:

1. Mahan, L.K. & Escott-Stump, S., *Krause's Food, Nutrition and Diet Therapy* (12th Ed.). Saunders Co., 2007.
2. Nelms, M., Long, S. & Lacey, K., *Medical Nutrition Therapy A Case Study Approach* (3rd Ed.). Thomson Wadsworth, 2008.
3. Thomas, B., *Manual of Dietetic Practice* (4th Ed.). Oxford, UK: Blackwell Publication, 2007.

GTD326/3-Dietetics Practicum in Special Unit I

This course is a continuation of the Dietetic Internship I which will focus on dietetic services at special units in hospitals and clinics such as ICU, CCU, pediatric, hypertension unit and diabetes mellitus clinic. Evaluation of nutritional status, specific diet treatment and diet surveillance of patients before discharge will also be conducted. Patient diet management in wards whether normal, therapeutic or effective enteral-parenteral and the lag of diet regime planning including the evaluation of the effectiveness diet regimes will also be discussed. Students will be introduced to nutritional status evaluation and therapeutic care of HIV, kidney, neuro-muscular and skeletal systems diseases patients and those who suffer from cancer. Those enrolled in this course will also learn about topics related to operations and burns patients. Ethics and bed side counseling procedures during diet treatment session will be focussed in order to enhance students' communication skills. This will be undertaken with counselors. Emphasis will be on communicative ability with the patient's family especially on the diet of patients suffering from cancer and HIV.

List of text/reference books:

1. Werbach, M.R. & Moss, J., *Textbook of Nutritional Medicine*. Third Line Press, 2000.
2. Skipper, A. (Ed.), *Dietitian's Handbook of Enteral and Parenteral Nutrition* (2nd Ed.). Jones & Bartlett Publishers, 2011.

3. Nelms, M., Roth, S.L. & Lacey, K., *Medical Nutrition Therapy: A Case Study Approach* (3rd Ed.). Thomson Wadsworth, 2008.

GTF301/3-Physical Evidence

This course introduces students to characterization of different kinds of physical evidence using physicochemical properties. The evidences include: paint, glass, soil, fibres, and lamp filaments. Comparison microscopy for examination of physical evidence, experimental techniques for the restoration of erased numbers on different metal surfaces, and investigations related to cyber crime form part of the curriculum. Introduction to the use of lasers and electron microscopy in the examination of physical evidence of materials; and specialised photographic techniques including macrophotography, photomicrography and invisible radiation photography are also included. On completion of the course the student would acquire sufficient level of proficiency to carry out the scientific investigations into the above kinds of physical evidence. The course will be taught via lectures, tutorial, practical and discussion, Students will be assessed through tests, assignments, practical reports, practical test/OSPE and final examination.

List of text/reference books:

1. Jackson, A.R.W. & Jackson, J.M., *Forensic Science* (2nd Ed.). Pearson, Prentice Hall, 2008.
2. James, S.H. & Nordby, J.J., *Forensic Science: An Introduction to Scientific and Investigative Techniques* (3rd Ed.). CRC Press, 2009.
3. Baker, J.S., Fricke, L.B., Baker, K.S. & Aycock T.L., *Lamp Examination for ON or OFF in Traffic Collisions*. IL: North Western University Center for Public Safety, 2003.
4. Bertino, A.J., *Forensic Science: Fundamentals and Investigations*. Cengage Learning, 2008.

GTF305/4-Forensic Toxicology and Chemistry of Drugs

This course introduces students to fundamental concept of toxicology, forensic toxicology, poison, multiple poisoned material, chemistry and appearance of poisoned material, multiple procedures, best practices, conventional and innovative techniques and equipments employed to extract, identify and profile the poisoned material from biological and autopsy specimens. Classification and identification of drugs that commonly abused, modes of action in human body and techniques to identify and detect them will also be emphasised. The course will be taught via lectures, tutorial, practical and discussion, Students will be assessed through tests, assignments, practical reports, practical test/OSPE and final examination.

List of text/reference books:

1. Cole, M.D., *The Analysis of Controlled Substance*, New Jersey: John Wiley & Sons, 2003.
2. Flanagan, R.J., Taylor, A.A., Watson, I.D. & Whelpton, R., *Fundamentals of Analytical Toxicology*, New Jersey: Wiley-Interscience, 2008.

3. Jickell, S., Negrusz, A., Moffat, A.C, Osselton, M.D. & Widdop, B., *Clarke Analytical Forensic Toxicology*. London: Pharmaceutical Press, 2008.
4. Karch, S.B., *Postmortem Toxicology of Abused Drugs*. Boca Raton: CRC Press, 2008.
5. Moffat, A.C., Osselton, M.D. & Widdop, B., *Clarke's Analysis of Drugs and Poisons*, London: Pharmaceutical Press, 2011.

GTF306/3-Fire Investigation

This course introduces students to basics of fire and the causative factors of fire. The discussions provide knowledge in fire investigation to differentiate between a fire accident and arson and the safety measures to be followed during investigation. The lectures shall provide in detail the different types of material evidences often encountered in structure fires and forest fires; the methodology and current best practice to collect and pack them and appropriate instrumental analysis to process the evidence materials. The lectures also provide knowledge on various toxic substances usually encountered by humans in structure fires and also explains safety measures to be followed. The course will be taught via lectures, tutorial, practical and discussion, Students will be assessed through tests, practical report, presentation and final examination.

List of text/reference books:

1. David, J.I., Dehaan, J.D. & Haynes, G.A., *Forensic Fire Scene Reconstruction* (3rd Ed.). (Brady Fire), New York: Pearson, 2012.
2. DeHaan, J.D., Kirk, P.L. & Icove, J.D., *Kirk's Fire Investigation* (7th Ed.). (Brady Fire), New York: Pearson, 2012.
3. Stauffer, E., Dolan, J.A. & Newman, R., *Fire Debris Analysis*. Burlington: Academic Press, 2008.
4. *NFPA 921: Guide for Fire and Explosion Investigations*. Maryland: National Fire Protection Agency, 2011.
5. Redsicker, D.R., *Practical Fire and Arson Investigation* (2nd Ed.). CRC Press, Boca Raton, 1997.

GTF309/3-Forensic DNA Analysis

This course introduces students to the fundamental knowledge associated to forensic DNA analysis, including the earlier developments to the most recent advances. Student will also exposed to problems and cases associated in each technology involving DNA analysis and ways of troubleshooting to solve the problems. Students will be trained to use apparatus and latest innovative software invented for DNA analysis and interpret the result accordingly. At the end of the course, student will also being exposed to real forensic cases involving DNA analysis to improve their understanding of the importance of DNA technology in the field of Forensic Sciences. The course will be taught via lectures, practicals and problem-based learnings (PBL). Students will be assessed through tests, practical tests, experiments, assignments, presentations and final examination.

List of text/reference books:

1. Rudin, N. & Inman, K., *An Introduction to Forensic DNA Analysis* (2nd Ed.). CRC Press, 2001.
2. Butler, J. & Butler, J.M., *Biology and Technology Behind STR Markers*. Academic Press, 2001.
3. Budowle, B., Smith, J. & Moretti T., *DNA Typing Protocols: Molecular Biology and Forensic Analysis*. Eaton Pub. Co., 2000.
4. Butler, J.M., *Fundamentals of Forensic DNA Typing*. Academic Press, 2009.
5. Butler, J.M., *Advanced Topics in Forensic DNA Typing: Methodology*. Academic Press, 2011.

GTF311/3-Forensic Anthropology

This course introduces the students the fundamentals of Forensic Anthropology, the types of biological and peripheral evidence useful in anthropological analysis, crime scene and excavation techniques, handling the skeletal remains, anthropometric and anthroposcopic techniques useful for assessing race, sex, age and skull based personal identification using video superimposition method (hands-on) and applying specific radiological skeletal traits and the limitation therein, integrated and computer-assisted as well as morphological photo to photo comparison techniques and anthropological reconstruction of population biology. The course will be taught via lectures, tutorials, problem-based learning (PBL) and discussions. Students will be assessed through tests, practical reports, assignment and final examination.

List of text/reference books:

1. Komar, D.A. & Buikstra, J.E., *Forensic Anthropology, Contemporary Theory and Practice*. Oxford : Oxford University Press, 2008.
2. Pickering, R. & Bachman, D., *The Use of Forensic Anthropology* (2nd Ed.). Florida: Charles C. Thomas, 2009.
3. Krogman, W.M. & Iscan, M.Y., *The Human Skeleton in Forensic Medicine* (3rd Ed.). Illinois: Charles C.Thomas, 2013.
4. Iscan, M.Y. & Helmer, R.P. (eds), *Forensic Analysis of The Skull-Cranio Facial Analysis, Reconstruction, and Identification*. New York: Wiley Liss Inc., 1993
5. Byers, S.N., *Introduction to Forensic Anthropology*. Boston: Allyn & Bacon, 2002
6. Schmitt, A., Cunha, E. & Pinheiro, J., *Forensic Anthropology and Medicine: Complementary Sciences from Recovery to Cause of Death*. New Jersey: Humana Press, 2006
7. Byers, S.N., *Forensic Anthropology Laboratory Manual* (3rd Ed.). Pearson. Boston, 2011.
8. Haglund W.D. & Sorg M.H., *Forensic Taphonomy: The Postmortem Fate of Human Remains*. CRC Press, 1996.
9. Haglund W.D. & Sorg M.H., *Advances in Forensic Taphonomy: Method, Theory, and Archaeological Perspectives*. CRC Press, 2001.
10. Christensen, A.M., Passalacqua, N.V. & Bartelink, E.J., *Forensic Anthropology: Current Methods and Practice*. Academic Press, 2014.

GTF312/3-Organic Chemistry III

This course provides knowledge about the structure, nomenclature, synthesis, and reactions of amines, phenols and alcohols. This course also covers the study of carbohydrates and nucleic acids. The course would emphasize understanding of amino acids, peptides, proteins, lipids and synthetic polymers and their importance in increasing the quality of life. The course will be taught via lectures, tutorials and discussion. Students will be assessed through test, assignments, presentation of work from internet sources, reading materials or research articles and final examination.

Main references supporting this course:

1. Wade. L.G. Jr., *Organic Chemistry* (8th Ed.). New Jersey, Pearson Prentice Hall, 2013.
2. Solomons T.W.G. & Fryhle C.B., *Organic Chemistry* (10th Ed.). NJ: John Wiley & Sons, Inc., 2011.
3. Smith J.G., *Organic Chemistry* (3rd Ed.). New York: McGraw-Hill, 2011.
4. McMurry J.E., *Fundamentals of Organic Chemistry* (7th Ed.). Brooks/ Cole, 2011.

GTF313/3-Food Chemistry

This course introduces students to the classification and structure of carbohydrates, proteins, oils and fats. It also covers food flavour and food additives, food forensics and the importance of quality control in food, consequence of food fraud to quality of life and food security issues. The course will be taught via lectures, tutorials and discussion. Students will be assessed through test, seminar, assignment on research articles and final examination.

List of text/reference books:

1. Belitz, H-D., Grosch, W. & Schieberle, P., *Food Chemistry*. Springer, 2004
2. Hornback, J.M., *Organic Chemistry*. Thomson Brooks/Cole, 2005.
3. Damodaran, S., Parkin, K.L. & Fennema, O.R., *Fennema's Food Chemistry*, CRC Press, 2007
4. Akoh, C.C. & Min, D.B., *Food Lipids: Chemistry, Nutrition, and Biotechnology*. Boca Raton: CRC Press/Taylor & Francis Group, 2008.
5. Frey, C. & Rouseff, R., *Natural Flavors and Fragrances: Chemistry, Analysis, and Production*. Washington, DC: American Chemical Society, 2005.
6. Otlés, S., *Methods of Analysis of Food Components and Additives*. Boca Raton: CRC Press, 2005.

GTF314/2-Forensic Serology

This course introduces students to the concept of antigens and antibodies and various blood-proteins and enzymes present in the blood and body fluid. It also provides practical knowledge to group the body fluids from crime scene and its associate health hazards, to identify and individualise the samples. It also covers HLA system and its application to identify individuals, the identification of patterns and effects of blood value as evidence.

The course will be taught via lectures, tutorials and practical sessions. The students will be assessed via test, experiments, assignment and final examination.

List of text/reference books:

1. Bidwell, J.L., Navarrete, C. & Bodmer, W.F., *Histocompatibility Testing*. Imperial College Press, 2000.
2. Saferstein, R., *Forensic Science Handbook, Vol. II and III*. New Jersey: Regents/Prentice Hall, 1993.
3. Issitt, P.D., *Applied Blood Group Serology* (3rd Ed.). Montgomery Scientific Publication, 1985

GTF315/3-Biological Evidence

This course introduces the students to the multiple biological evidence types of both plant and animal origin that are found at the crime scenes, the methods of observing, describing and collecting them, their salient morphological features useful for identification and the procedures and best practice used in the laboratory to investigate these evidence. The evidence types focused include, among others, pollen grains, diatoms, wood, hairs and natural fibres, damages in cloth and necrophagous insects. Emerging areas in forensic biology such as wild life and marine forensics and bioterrorism are also included. The course will be taught via lectures, tutorials and problem-based learning (PBL). Students will be assessed through tests, practical reports, assignment and final examination.

List of text/reference books:

1. Gunn A., *Essentials of Forensic Biology*, England: John Wiley & Sons, 2009.
2. Siegel, J., Knupfer, G. & Saukko, P., *Encyclopedia of Forensic Sciences* (2nd Ed.). Academic Press, London, 2013.
3. Saferstein, R. (Ed.), *Forensic Science Handbook, Vol. II & III*, (2nd Ed.). New Jersey: Prentice-Hall, 2009.
4. Byrd, J.H. & Castner, J.L., *Forensic Entomology: The Utility of Arthropods in Legal Investigations* (2nd Ed.). Boca Raton: CRC Press, 2010.
5. Ogle, R.R. & Fox, M.J., *Atlas of Human Hair Microscopic Characteristics*. Boca Raton: CRC Press, 1999.
6. Robertson, J. & Grieve, M., *Forensic Examination of Fibres*. London: Taylor & Francis, 1999.

GTJ319/3-Nursing Foundation Practicum II

This course introduces student to practicum nursing foundation II. It covers the concept related to activities of daily living, therapeutic interventions in nursing, medical and surgical management of patients with cardiovascular, respiratory, gastroenterology and nephrology/urology problems. It also encourages cultural diversity and safety in nursing. Students will be assessed through practical tests and log book.

List of text/reference books:

1. Berman, A., Synder, S., Kozier, B. & Erb, G., *Fundamental of Nursing: Concepts, Process and Practice* (9th Ed.). New Jersey: Pearson, 2012.
2. deWit, S.C. & O’neill, P., *Fundamental Concepts and Skills for Nursing* (4th Ed.). St. Louis: Elsevier Saunders, 2014.
3. Potter, P.A. & Perry, A.G.P., *Fundamentals of Nursing* (7th Ed.). Singapore: Elsevier Mosby, 2011.
4. Smith, S.F., Duell, D.J. & Martin, B.C., *Clinical Nursing Skills: Basic to Advanced Skills* (8th Ed.). NJ: Pearson Edu., 2012.

GTJ320/3-Medical-Surgical Nursing III (Endocrine and Musculoskeletal)

This course introduces students to medical-surgical management of patient’s with endocrine and musculoskeletal diseases. The nursing care incorporates the concept of best practice with multi-disciplinary approach. This course is taught via student centered learning: lectures, small group discussion, and practical sessions. Students will be assessed through assignment, presentation, OSCE and final examination.

List of text/reference books:

1. LeMone, P. & Burke, K., *Medical-Surgical Nursing: Critical Thinking in Client Care* (4th Ed.). New Jersey: Pearson Prentice Hall, 2008.
2. Timby, B.K. & Smith, N., *Introductory Medical Surgical Nursing* (10th Ed.). Philadelphia: Lippincott Williams & Wilkins, 2010.
3. Sublett, C. & Blair, M., *Medical Surgical Nursing: Clinical Management for Positive Outcomes* (8th Ed.). St. Louis: Saunders Elsevier, 2008.
4. Smith, S.F., Duell, D.J., & Martin, B.C., *Clinical Nursing Skills: Basic to Advanced Skills* (8th Ed.). New Jersey: Pearson Edu., 2012.

GTJ321/3-Medical-Surgical Nursing IV (Neurology, Otorhinolaryngology and Ophthalmology)

This course introduces students to medical-surgical management of patient’s with neuro, otorhinolaryngology and ophthalmology diseases. The nursing care incorporates the concept of best practice with multi-disciplinary approach. This course is taught via student centered learning: lectures, small group discussion, and practical sessions. Students will be assessed through assignment, presentation, OSCE and final examination.

List of text/reference books:

1. Timby, B. K. & Smith, N. E., *Introductory Medical Surgical Nursing*. Philadelphia: W. W. Lippincott, 2010.
2. LeMone, P., Burke, K. & Bauldoff, G., *Medical-Surgical Nursing: Critical Thinking in Ppatient Care* (5th Ed.). New Jersey: Pearson Prentice Hall, 2013.

3. Smeltzer, S.C., & Bare, B.G., Hinkle, J.L. & Cheever, K.H., *Brunner & Suddarth's Textbook of Medical-Surgical Nursing* (12th Ed.). Philadelphia: Lippincott William & Wilkins, 2010.
4. Smith, S.F., Duell, D.J. & Martin, B.C., *Clinical Nursing Skills: Basic to Advanced Skills* (8th Ed.). New Jersey: Pearson Edu., 2012.

GTJ322/3- Mental Health and Psychiatric Nursing

This course introduces students to the mental health and psychiatric conditions. The nursing care exposes students to the biopsychosocial model in psychiatric care as well as incorporates collaborative partnership with community engagement. The concept of best practice with innovative approach is emphasised. This course is taught via student centered learning: lectures, small group discussion, and practical sessions. Students will be assessed through assignment, presentation and final examination.

List of text/reference books:

1. Fortinash, K.M., & Warret, H., *Psychiatric Mental Health Nursing* (5th Ed.). USA: Mosby, Elsevier Inc., 2012.
2. Kneisl, C.R., & Trigoboff, E., *Contemporary Psychiatric-Mental Health Nursing* (3rd Ed.). UK: Pearson Education, Inc., 2013.
3. Stuart, G.W., *Principle and Practice of Psychiatric Nursing* (10th Ed.). USA: Mosby, Elsevier Inc., 2013.

GTJ323/3-Medical-Surgical Nursing V (Dermatology, Immunology, Haematology and Oncology)

This course introduces students to the diseases of dermatology, immunology, haematology and oncology as well as the medical and surgical management. The nursing care incorporates sustained quality of life, rehabilitation and palliative care with inter-disciplinary approach. This course is taught via student centered learning: lectures, small group discussion, and practical sessions. Students will be assessed through assignment, OSCE and final examination.

List of text/reference books:

1. Timby, B. K. & Smith, N. E., *Introductory Medical-Surgical Nursing*. Philadelphia: W. W. Lippincott, 2010.
2. LeMone, P., Burke, K. & Bauldoff, G., *Medical-Surgical Nursing: Critical Thinking in Patient Care* (5th Ed.). New Jersey: Pearson Prentice Hall, 2013.
3. Smeltzer, S.C., & Bare, B.G., Hinkle, J.L. & Cheever, K.H., *Brunner & Suddarth's Textbook of Medical-Surgical Nursing* (12th Ed.). Philadelphia: Lippincott William & Wilkins, 2010.
4. Smith, S.F., Duell, D.J., & Martin, B.C., *Clinical Nursing Skills: Basic to Advanced Skills* (8th Ed.). New Jersey: Pearson Edu., 2012.

GTJ324/3-Critical Care Nursing

This course introduces students to critical care nursing. The nursing care incorporates sustained quality of life, rehabilitation with multi-disciplinary approach. This course is taught via student centered learning: lectures, small group discussion, and practical sessions. Students will be assessed through assignment, presentation, quiz, OSCE and final examination.

List of text/reference books:

1. Gonce, P. & Morton, D.K., *Essentials of Critical Care nursing: A Holistic Approach*. Fontaine Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 2013.
2. Lou, S.M., Klein, D.G. & Marthe, J.M., *Introduction to Critical Care Nursing*, (6th Ed.). St. Louis: Elsevier/Saunders, 2013.
3. Urden, L.D., Stacy, K.M., & Lough, M.E., *Critical Care Nursing: Diagnosis and Management* (7th Ed.). St. Louis: Elsevier/Mosby, 2014.

GTJ325/3-Neonatal and Pediatric Nursing

This course introduces students to neonatal and pediatric nursing. The nursing care incorporating sustainability quality of life, safety, security, and rehabilitation with multi-disciplinary approach. It also collaborate nurse-parents partnership. This course is taught via student centered learning: lectures, small group discussion, and practical sessions. Students will be assessed through assignment, presentation, OSCE and final examination

List of text/reference books:

1. Ball, J.W., Bindler, R. C. & Cowen, K.J., *Principles of Pediatric Nursing: Caring for Children*. Boston: Pearson, 2012.
2. Hockenberry, M. J. & Wilson, D., *Wong's Essential of Pediatric Nursing* (9th Ed.). St. Louis: Elsevier Saunders, 2013.
3. Terri, K., *Essentials of Pediatric Nursing*. Philadelphia: Lippincott Williams & Wilkins, 2008.
4. James, S.R., Nelson, K.A., & Ashwill, J.W., *Nursing Care of Children: Principles and Practices* (4th Ed.). St. Louis: Elsevier Saunders, 2013.

GTJ326/3-Gerontological Nursing

This course introduces students to gerontological nursing. The geriatric nursing care incorporating sustainability quality of life, safety, security, and rehabilitation with multi-disciplinary approach. It also collaborate best practice and community engagement. This course is taught via student centered learning: lectures, small group discussion, and practical sessions. Students will be assessed through assignment, presentation, quiz, OSCE and final examination

List of text/reference books:

1. Ebersole, P., Hess, P., Touhy, T.D., Jett, K. & Luggen, A.S., *Towards Healthy Ageing: Human Needs and Nursing Response* (7th Ed.). St. Louis: Mosby Elsevier, 2008.
2. Miller, C.A., *Nursing for Wellness in Older Adults* (5th Ed.). Philadelphia: Lippincott Williams and Wilkins, 2009.
3. Touhy, T.A., & Jett, K.F., *Gerontological Nursing & Healthy Aging*. Missouri: Elsevier Mosby, 2014.

GTJ327/3-Nursing Education

This course introduces students to nursing education. It incorporates creative and innovative teaching and learning. The knowledge transformation will be used for health promotion in achieving sustainable health. This course is taught via student centered learning: lectures, small group discussion, and practical sessions. Students will be assessed through assignment, presentation, and practical test.

List of text/reference books:

1. DeYoung, C.S. & Miessler G.L., *Teaching Strategies for Nurse Educators*. New Jersey: Prentice Hall. 2003.
2. Billings, D.M. & Halstead, J.A., *Teaching in Nursing: A Guide for Faculty* (3rd Ed.). St. Louis: Saunders Elsevier Publisher, 2009.
3. Hall, G.E., Quinn, L.F. & Gollnick, D.M., *Introduction to Teaching: Making a Difference in Student Learning*. California: SAGE Publication, 2014.
4. Lowenstein, A.L. & Bradshaw, M.J., *Fuszard's Innovative Teaching Strategies in Nursing* (3rd Ed). Sudbury: Jones & Bartlett Publisher, 2004.

GTK301/4-Environmental And Occupational Toxicology

This course focuses on understanding the effects of toxic chemicals that can harm and damage living organisms and their environment. This course also describes the target organ toxicity (hematotoxicity, neurotoxicity, hepatotoxicity, nephrotoxicity, neurotoxicity, dermatotoxicity, pulmonary toxicity and reproductive organ toxicity) and chronic toxicity effects (carcinogenesis, mutagenesis and teratogenesis). The classes of environmental and occupational toxicants also discussed to develop awareness in conserving and preserving environmental health to sustain the health of living organism in the entire ecosystem. Students are trained to think of alternative methods to reduce the production of toxic waste from multiple sources to the environment. Monitoring of heavy metals contaminants in biota is also being exaggerated. The course is delivered through lectures, tutorials and practical. Students are tested through assignments, laboratory reports and final examination.

List of text/reference books:

1. Clements, W.H., *Community Ecotoxicology*. John Wiley & Son. 2002.
2. Hayes, A.W., *Principles and Methods of Toxicology* (5th Ed.). Taylor & Francis. 2007.

3. Manahan, E.S., *Fundamentals of Environmental and Toxicological Chemistry: Sustainable Science* (4th Ed.). CRC Press. 2013.
4. Paul, I., *Toxicity and Risk: Context, Principles and Practice*. Routledge, London. 2001.
5. Winder, C. & Stacey, N.H., *Occupational Toxicology*. CRC Press. 2004.

GTK302/3-Environmental And Occupational Health From Engineering Perspective

This course discusses the relevant theory and application of engineering knowledge, especially mechanical and civil engineering in implementing engineering controls to reduce the level of pollutants in the workplace environment. This course also explains the preventive measures against pollution problems in buildings through appropriate selection of building materials. To sustain a building, elements for the construction, operation, maintenance and renovation of green buildings is also a major focus of the lessons in this course. The importance of creating green buildings lead to the efficient use of energy, water and other resources that may help to reduce waste, pollution and environmental degradation. In addition, health problems related to ergonomics has also become a major focus for this course. Understanding related to these topics tested by implementing mini projects with emphasis on the management of human health problems. The course is delivered via lectures, tutorials, problem-based learning and mini projects. Students will be assessed through assignments, presentations, quizzes, and final examination.

List of text/reference books:

1. Code of Practice, *Design and Construction*. British Standards Institution, 1997.
2. Code of Practice, *Indoor Air Quality*. DOSH, Malaysia, 2010.
3. Davis M.L. & Masten S.J., *Principles of Environmental Engineering and Science*. McGraw-Hill, 2004.
4. De Nevers N., *Air Pollution Control Engineering*. McGraw-Hill, 2000.
5. *Uniform Building By-Laws*, MDC Publishers, 2011.
6. Mohd Zaid Y., *Teknologi Industri: Kawalan Mutu dan Peralatan*. Dewan Bahasa & Pustaka, 1996.

GTK303/3-Domestic, Laboratory And Industrial Waste Management

This course introduces legal requirements related to the management of solid waste, scheduled waste and radioactive waste. The method of quantification, handling, storage, labelling, transportation, processing and disposal of these wastes are discussed. In addition, the safety aspects of handling waste and the impact of unsystematic waste management to environment and human health are also emphasised. Waste-to-energy technologies used in the incineration, sanitary landfill and refused-derived fuel processes and 3Rs (Reduce, Reuse, Recycle) concept will be introduced. By reducing the amount of waste generated, reusing product, recycling and use of renewable energy help lessen the impact on the environment such as climate change. These will also enable sustainable

production and consumption patterns. This course is taught via lectures, tutorials, and problem based learning. Students are assessed through assignments, presentation, quizzes, tests and final examination.

List of text/reference books:

1. *Atomic Energy Licensing Act 1984 (Act 304) and Atomic Energy Licensing (Radioactive Waste Management) Regulations 2011*. Percetakan Nasional Malaysia Berhad. 2006.
2. Cheremisioff N.P., *Handbook Of Solid Waste Management And Waste Minimization Technology*, Elsevier Science, 2002.
3. *Environmental Quality Act 1974 (Act 127) Regulations, Rules & Orders*. International Law Books Services. 2011.
4. Hester, R.E & Harisson, R.M., *Environmental And Health Impact Of Solid Waste Management Activities*. Royal Society of Chemistry, Cambridge, 2002.
5. Baud, I., Post, J. & Furedy C., *Solid Waste Management And Recycling: Actors, Partnerships & Policies In Hyderabad*. India & Nairobi, Kenya: Kluwer Academic Publishers, 2004.
6. *Solid Waste and Public Cleansing Management Act 2007 (Act 672)*. MDC Publishers. 2009.

GTK305/3-Environmental And Occupational Health Related Diseases

The course discusses on the variety of diseases caused by environmental pollutants and workplace contaminants. The health of workers is an important particular to ensure good quality of life. This course also introduces students to the types of environmental and occupational diseases, its symptoms and medical surveillance. The course is delivered through lectures and case discussions. Students will be assessed through performance in practical operation, log books, reports and final examination.

List of text/reference books:

1. Koran, H., *Environmental And Occupational Health* (2nd Ed.). CRC Press, 2004.
2. La Dou J., *Current Occupational And Environmental Medicine* (3rd Ed.). Lange Medical Books, 2003.
3. Reese, C.D., *Occupational, Health And Safety Management: A Practical Approach*. Lewis Publishers, 2003.
4. Yassi, A., Kjellström, T., de Kok, T.L. & Guidotti T.L., *Basic Environmental Health*. Oxford University Press, New York, 2001.

GTK307/3-Occupational Rehabilitation

This course introduces students to the theory and application of ergonomic and body mechanics at workplace in order to prevent workers from injuries. The content of the course will focus on the role of occupational health and safety officers in monitoring the application of proper ergonomics and body mechanics as well as the rehabilitation of workers at workplace. The students will be able to understand the rehabilitation process

and return to work program if there are any injuries sustain by the workers. The course is delivered through lectures and case discussions. Students will be assessed through performance in practical operation, log books, reports and final examination.

List of text/reference books:

1. Bridger, R.S., *Introduction To Ergonomics* (2nd Ed.). New York: Taylor & Francis Group, 2008.
2. Bureau of Labor Statistics. September, 1996. *Recordkeeping Guidelines for Occupational Injuries and Illness*. US Department of Labor, Bureau of Labor Statistics.
3. Karwowski, W. & Marras, W.S. (Eds.), *Occupational Ergonomics: Design and Management of Work Systems. Principles and Applications in Engineering Series*. CRC Press, Florida, 2003.
4. OSHA Ergonomic Standards, *Occupational Safety and Health Administration*, 2000.
5. US Congress (101st-433), *Americans With Disabilities Act (PL 101-336)*, 1990.
6. *US Office of Management and Budget. 1987. Standard Industrial Classification Manual*. National Technical Information Service, PB87-100012.

GTK310/4- Measurement and Monitoring of Contaminants

This course introduces the important principle and concept of industrial hygiene, in evaluating the levels of contaminants both in the environmental and workplace settings, for control and prevention of ill health. Besides being introduced theoretically in lectures, students are able to have a hands-on fieldwork assessment of environmental air, water and soil pollution. Observations on climate change factors and disaster management will also be discussed during the practical session. Hygiene monitoring of workplace exposure hazards such as dust and particulate matter, chemical, noise, microbiological, heat stress and indoor air quality monitoring will be practiced. Here, students will learn about the sampling methods, sample transportation and storage as well as analysis using analytical instrumentation such as Atomic Absorption Spectrophotometer. This course eventually can help to suggest suitable control and prevention measures of multiple health problems that may occur among workers who are constantly exposed to unhealthy environments in the workplace. These will further contribute towards maintaining the sustainability of the environment and biodiversity, health and safety of workers and the public, conservation of natural resources, support sustainable development and increase productivity. Overall, the course is delivered through lectures, tutorials and practical based learning. Students will be assessed through assignments, hygiene reports, tests, quizzes, and final examination.

List of text/reference books:

1. Asfahl, C.R., *Industrial Safety and Health Management* (5th Ed.). New Jersey: Prentice-Hall Inc., 2004.
2. Fifield, F.W. & Haines P.J., *Environmental Analytical Chemistry*, UK: Blackwell Science, 2000.
3. Friedrich, R. & Reis, S., *Emission Of Air Pollutants: Measurement, Calculation And Uncertainties*.UK: Springer, 2004.

4. Nims, D., *Basics of Industrial Hygiene*. Canada: John Wiley & Sons, Inc., 1999.
5. Vallero, D., *Environmental Contaminant: Assessment and Control*, London: AP, 2004.
6. Vincent J.H., *Particle Size: Selective Sampling for Particulate Air Contaminants*, London: Academic Press, 1998.

GTK311/4-Environmental And Occupational Emergency

This course describes major accidents and disasters that have had occurred or may occur in Malaysia and Southeast Asia which could affect the environment and workers' life. The concern on workers safety and security are highlighted. Students are also introduced to the concept of disaster prevention and the establishment of an Emergency Response Plan (ERP) and Emergency Response Team (ERT). The course is delivered through lectures, tutorials and practical. Students will be assessed through assignments, laboratory reports and final examination.

List of text/reference books:

1. Erickson, P.A., *Emergency Response Planning for Corporate and Municipal Managers*. Academic Press, 1999.
2. Greece, S.A., *International Resources Guide To Hazardous Chemicals: Manufacturers, Agencies, Organizations And Sources of Information*. William Andrew Publishing, 2003.
3. Leigh J.P., Markowitz S., Fahe M. & Landrigen P., *Costs of Occupational Injuries And Illnesses* (4th Ed.). University of Michigan Press, 2003.
4. Parcell P., *Disaster Prep 101: The Ultimate Guided Emergency Readiness*. Info Quest, 2004.

GTN309/3-Nutrition and Diseases

This course will introduce students to the terms used in medical field, and the underlying causes, predisposing factors and pathophysiologic changes during diseases of different system of our body. It also covers effect of the disease on the nutritional status of the patient, and relationship of the pathophysiological changes with nutrition intervention. This course will be taught via lecture and discussion session. Students will be assessed through continous assessment, assignment, presentation and final examination.

List of text/reference books:

1. Ganong, W., *Review of Medical Physiology* (21st Ed.). Appleton & Lange, 2005.
2. Kumar, P. and Clark, M. L., *Clinical Medicine* (8th Ed.). W.B. Saunders Company, 2012.
3. Kumar, V. and Abbas, A.K., *Robbins & Cotnan Pathologic Basis of Disease* (9th Ed.). W.B. Saunders Company, 2014.
4. Geissler C. & Powers H., *Human Nutrition* (12th Ed.). Elsevier/ Churchill Livingstone, 2010.

GTN311/3-Food Service Management

This course will introduce students to the important aspects of catering, planning and food service management, menu planning, selection of catering equipments, food service system, and also methods, principles and preparation techniques of nutritious and tasty food in bulk quantities. It also covers food safety and sanitation, dynamic flows of food from the purchasing stage up to the serving of patients or clients with stipulated time. This course will be taught via lecture, tutorial and discussion session. Students will be assessed through continuous assessment, assignment and final examination.

List of text/reference books:

1. Byers, B.A., Shanklin, C.W. & Hoover, L.A., *Food Service Manual for Healthcare Institutions* (4th Ed.). JB-AHA Publishers, 2004.
2. Knight, J.B., & Korschevar, L.H., *Quantity Food Production, Planning and Management*. New York: Van Nostrand Reinhold, 2006.
3. Gregoire, M. B. & Spears M.C., *Food Service Organization: A Managerial and Systems Approach* (6th Ed.). Prentice Hall, 2006.

GTN315/4-Community Nutrition and Dietetics Services Practicum

This course will introduce students to communities such as the squatter population, homes for the handicapped, old folks homes, pregnant mothers, health care clinics and centers for a period of 8 weeks to promote health activity and to educate the community on imbalance nutritional habits. It also enables the students to face real life situation as dietitians in the community and are required to be involved and to conduct educational activity either in the form of educational talks or demonstrations in order to increase the awareness of selected populations towards acquiring optimal nutrition and also the students will gather knowledge about the role of a selected health care agency in a community setup. This course will be taught via student centred learning (SCL) lectures and discussion session. Students will be assessed through assignment, report, presentation and final examination.

List of text/reference books:

1. Homan, M.S., *Promoting Community Change- Making it Happen in the Real World*. Belmont Thompson Higher Education, 2010.
2. Nutrition Society, Gibney, M.J., (Eds), *Public Health Nutrition*. Blackwell Publishers, 2003.
3. Heber, D., *Nutrition for Primary Care*. Saunders W B Co, 2000.
4. Morgan, J.B. & Dickerson, J.W.T. (Eds.), *Nutrition in Early Life*. John Wiley & Sons, Inc., 2003.

GTN316/3-Food and Nutrition Toxicology

This course gives knowledge to students on toxicology related to food and the human food chain. It also covers fundamental concepts including absorption of toxicants, distribution and storage of toxicants, biotransformation and elimination of toxicants, and target organ toxicity. The course will examine chemicals of food interest, such as food processing, food additives, natural products (plants and fungi), mycotoxins, and pesticides, and how they are tested and regulated. The role of government agencies or specific bodies such as Hazard Analysis Critical Control Point (HAACP) and Good Manufacturing Practice (GMP) requirements of factories and other food industries will also be taught. This course will be delivered via student centred learning (SCL) lectures, tutorials, discussion and visit sessions. Students will be assessed through tests, individual assignment, group assignment, visit reports and final examination.

List of text/reference books:

1. Shibamoto T & Bjeldanes, L.F., *Introduction to Food Toxicology* (2nd Ed.). Elsevier Inc., 2009.
2. Helferich, W. & Winter C.K., *Food Toxicology*. Marcel Dekker, Inc., 2001
3. Omaye S.T., *Food and Nutritional Toxicology*. CRC Press LLC, 2004.
4. Despande, S.S., *Handbook of Food Toxicology*. CRC Press, 2002.

GTN317/4-Food Microbiology

This course covers the role of microorganism in food, identification methods and classifications, and intrinsic and extrinsic factors which affect the microorganisms growth. It also covers 'Hazard Analysis Critical Control Point' (HACCP), ISO 22000, 'Good Manufacturing Practice' (GMP) [*Amalan Pengilangan yang Baik*] and Malaysia Food Act [Akta Makanan Malaysia 1983] which are applied in food industries in Malaysia and the world. This course will be taught via lectures, tutorials, practical sessions and discussion. Students will be assessed through test, assignment, practical reports and final examination.

List of text/reference books:

1. Ray, B. & Bhunia A., *Fundamental Food Microbiology*. London: CRC Press, 2013.
2. Khalilah Abdul Khalil, *Food Microbiology: A Laboratory Manual*. Pusat Penerbitan Universiti, 2007.
3. Adams, M.R. & Moss M.O., *Food Microbiology* (3rd Ed.). Cambridge: Royal Society of Chemistry, 2008.
4. Montville, T.J., Matthews, K.R. & Knile K.E., *Food Microbiology: An Introduction*. ASM Press, 2012.
5. Yousef, A.E. & Carlstrom C., *Food Microbiology: A Laboratory Manual*. John Wiley & Sons Inc, New York, 2002.

GTN318/3-Nutrition Anthropology

This course will introduce students to the study of human nutrition from the perspective of anthropology ranging from the aspects of biological, ecological and social influence of diet and human nutrition, referring to how diet affects human behavior and culture, and how culture affects human behavior and nutrition. It also covers a review of cross-cultural diversity in terms of diet, nutritional status and life advice system, as well as differences in the factors of human existence is the result of the evolution of the pre-historic to modern times and provide some basis that can be used to assess the reliability and reasonableness of the policy and dietary recommendations are featured in daily modern life. This course will be taught via lectures and discussion session. Students will be assessed through continuous assessment, report, presentation and final examination.

List of text/reference books:

1. Bryant, C.A., DeWalt, K.M., Courtney, A. & Schwartz, J., *The Cultural Feast : An Introduction to Food and Society* (2nd Ed.). Belmont, CA: Wadsworth/Thomson Learning, 2003.
2. Pollan, M., *The Omnivore's Dilemma: A Natural History of Four Meals*. New York: Penguin, 2007.
3. Kittler, P.G., Sucher, K.P. & Nelms, M., *Food and Culture* (6th Ed.). Belmont, CA: Wadsworth / Thomson Learning, 2011.

GTP303/2- Neuropsychology

This course introduces students to the fundamental neuropsychology teaching on memory, emotion, perception, visual recognition, language and the recovery of brain function. This course is important for the students to understand the neuropsychological assessment results in order to innovate and collaborate in partnership for proper diagnosis and management of the speech pathology cases to improve patients quality of life.. This course is taught via lecture, tutorial, and discussion session. Student will be assessed through assignment, quiz, presentation and a final examination.

List of text/reference books:

1. Elias, L.J. & Saucier, D.M., *Neuropsychology: Clinical and Experimental Foundations*. London: Pearson Education, Inc., 2006.
2. Halligan, P.W., Kischka, U. & Marshall, J.C., *Handbook of Clinical Neuropsychology* (2nd Ed.). Oxford: Oxford University Press, 2010.
3. Kolb, B. & Wishaw, I.Q., *Fundamentals of Human Neuropsychology* (6th Ed.). New York: Worth Publishers, 2009.
4. Martin, G.N., *Human Neuropsychology* (2nd Ed.). London: Pearson Education Limited, 2006.
5. Morgan, J.E. & Ricker, J.H., *Textbook of Clinical Neuropsychology*. New York: Taylor and Francis Group, 2008.

GTP304/3- Speech Pathology Clinic III

This course trains students to fully conduct clinical session under supervision. The main caseloads in this course are developmental language disorders, hearing impairment and speech sound disorders. The students are required to design the individualized assessment and intervention plans for their patients. They are required to administer and apply these plans in managing their patients. This course is delivered through clinical session and case discussion. Students are assessed on their clinical performance, log book, case history report and case presentation.

List of text/reference books:

1. Paul, R., *Language Disorders From Infancy Through Adolescence: Assessment and Intervention* (3rd Ed.). St. Louis: Mosby, 2006.
2. Meyer, S. M., *Survival Guide for the Beginning Speech-Language Clinician* (2nd Ed.). London: Pro-Ed Inc., 2004.
3. Hedge, M. N., *Clinical Methods and Practicum in Speech-Language Pathology*. New York: Thomson Delmar Learning, 2005.
4. Gordon-Brannan, M., *Clinical Management of Articulatory and Phonologic Disorders* (3rd Ed.). New York: Lippincott Williams & Wilkins, 2007.
5. Roth, F. & Worthinston, C., *Treatment Resources Manual for Speech Language Pathology* (4th Ed.). New York: Delmar, 2010.

GTP306/3- Voice and Resonance Disorders

This course discusses in depth on the fundamental theories on voice disorders, including laryngeal speech, and resonance disorders. It covers on methods of assessment and principles of interventions in managing individuals with voice disorders and resonance disorders. This course is taught via lecture, tutorial and problem based learning. Students are assessed through quiz, test, report, and final examination.

List of text/reference books:

1. Boone, D.R., McFarlane, S.C., Von Berg, S.L. & Zraick, R.I., *The Voice and Voice Therapy* (8th Ed.). Boston: Allyn and Bacon, 2009.
2. Andrews, M.L., *Manual of Voice Treatment: Pediatrics Through Geriatrics* (3rd Ed.). San Diego: Singular Publishing Group, 2006.
3. Stemple, J.C., Glaze, L.E., & Klaben, B.G., *Clinical Voice Pathology: Theory and Management* (4th Ed.). San Diego: Singular Publishing Group, 2009.
4. Kummer, A.W., *Cleft Palate and Craniofacial Anomalies the Effects on Speech and Resonance*. San Diego: Singular, 2007.

GTP311/3-Counseling for Communication Disorders

This course emphasises on fundamental aspects of counseling in the fields of audiology and speech pathology. It also focuses on the application of counseling methodologies in the management of individuals with communication disorders, as well their families. This course is taught via lecture, tutorial and problem based learning. Students are assessed through assignment, practical, presentation, and final examination.

List of text/reference books:

1. Flasher, L.V. & Fogel, P.T, *Counseling Skills for Speech-Language Pathologist and Audiologist*. Albany: Thompson Delmar Learning, 2004.
2. Luterman, D.M., *Counseling Persons With Communication Disorders and Their Families* (5th Ed.). Austin: Pro-Ed., 2008.
3. Clark, K., & English, J., *Counseling in Audiologic Practice: Helping Patients and Families Adjust to Hearing Loss*. Boston: Allyn & Bacon, 2004.
4. Nelson-Jones, R., *Introduction to Counseling Skills* (3rd Ed.). London: Sage Publication Ltd., 2000.

GTP312/2- Augmentative and Alternative Communication

This course exposes students to the fundamental theories of augmentative and alternative communication (AAC) as a communication method for those who cannot communicate verbally. It covers on types and characteristics of ACC. Principles of prescription, assessment and intervention of AAC are also included in this course. This course is taught via lectures, tutorials, and problem based learning. Students are assessed through assignment, presentation and final examination.

List of text/reference books:

1. Beukelman, D.R. & Mirenda, P., *Augmentative and Alternative Communication: Management of Severe Communication Disorders in Children and Adults* (4th Ed.). Baltimore: Brookes Publishers, 2012.
2. Tetzchner, S.V., & Martinsen, H., *Introduction to Augmentative and Alternative Communication*. London: Whurr Publishers, 2000.
3. Cockerill, H., & Carrollfrew, L., *Communicating Without Speech: Practical Augmentative and Alternative Ccommunication Clinics for Children (Clinics in Developmental Medicine)*. London: Mac Keith Press, 2001.

GTP313/3- Acquired Language Disorders

This course discusses in depth on acquired language disorders. It focuses on aphasia with additional exposures on communication disorders due to dementia, right hemisphere syndrome dan traumatic brain injury. It also discusses assessment and intervention techniques for these disorders. This course is taught via lecture, tutorials and problem based learning. Students are assessed through quiz, test, report, presentation and final examination.

List of text/reference books:

1. Murdoch, B.E., *Acquired Speech and Language Disorders: A Neuroanatomical and Functional Neurological Approach* (2nd Ed.). West Sussex: John Wiley & Sons Ltd., 2010.
2. Chapey, R., *Language Intervention Strategies in Aphasia and Related Neurogenic Communication Disorders* (5th Ed.). Philadelphia: Lippincott Williams & Wilkins, 2008.

- Hedge, M.N., *A Coursebook on Aphasia and Other Neurogenic Language Disorders* (3rd Ed.). San Diego: Delmar Cengage Learning, 2005.
- Pointe, L.L., *Aphasia and Related Neurogenic Language Disorders* (3rd Ed.). New York: Thieme, 2005.

GTP314/2- Motor Speech Disorders

This course introduces students to the management of motor speech disorder cases i.e., apraxia of speech and dysarthria. It covers etiologies, neurological characteristics, assessments, diagnosis, and intervention for motor speech disorder cases. This course is taught via lecture, tutorial, and problem-based learning (PBL). Students are assessed through assignment, presentation quiz and final examination.

List of text/reference books:

- Duffy, J. R., *Motor Speech Disorders: Substrates, Differential Diagnosis, and Management* (3rd Ed.). St Louis: Elsevier Health Sciences, 2012.
- Freed, D.B., *Motor Speech Disorders: Diagnosis & Treatment*. New York: Delmar Cengage Learning, 2011.
- Brookshire, R.H., *Introduction to Neurogenic Communication Disorders* (7th Ed.). St. Louis: Mosby, 2007.
- Hedge, M.N., *A Coursebook on Aphasia and Other Neurogenic Language Disorders* (2nd Ed.). San Diego: Singular Publishing Group, 2007.

GTP315/3- Speech Pathology Clinic IV

This course trains students to fully conduct clinical session under supervision. The main caseloads in this course are developmental language disorders, hearing impairment, speech sound disorders and voice disorders. The students are required to design the individualized assessment and intervention plans for their patients. They are required to administer and apply these plans in managing their patients. This course is delivered through clinical session and case discussion. Students are assessed on their clinical performance, log book, case history report and case presentation.

List of text/reference books:

- Roth, F., & Worthington, C., *Treatment Resource Manual for Speech Language Pathology* (4th Ed.). New York: Delmar, 2010.
- Hedge, M.N., *Clinical Methods and Practicum in Speech-Language Pathology* (5th Ed.). New York: Thomson Delmar Learning, 2009.
- Dollaghan, C., *Handbook for Evidence-Based Practice in Communication Disorders*. London: Paul H. Brookes Pub. Co., 2007.
- Paul, R., *Language Disorders From Infancy Through Adolescence: Assessment and Intervention* (3rd Ed). St. Louise: Mosby, 2006.
- Paul, R. & Norbury, C., *Language Disorders From Infancy Through Adolescence: Listening, Speaking, Reading, Writing, and Communicating* (4th Ed.). St. Louise: Mosby, 2012.

GTP316/3- Learning Disabilities

This course introduces students to the aspects of learning disabilities and education for children with communication disorders. It covers theories and processes of learning, etiologies and characteristics of learning disabilities with an emphasis on the educational issues that are related to these children. This course is taught via lecture, tutorial, and problem-based learning. Students are assessed through assignment, report, presentation, and final examination.

List of text/reference books:

1. Harwell, J.M. & Jackson R.W., *The Complete Learning Disabilities Handbook: Ready-to-Use Strategies and Activities for Teaching Students with Learning Disabilities*. California: Jossey-Bass Publisher, 2008.
2. Lerner, J.W., *Learning Disabilities: Theories, Diagnosis, and Teaching Strategies* (10th Ed.). Boston: Houghton Mifflin, 2005.
3. Fletcher, M., Lyon, G.R., Fuchs, L.S., & Barnes, M.A., *Learning Disabilities: From Identification to Intervention*. New York: The Guilford Press, 2006.

GTP317/2- Swallowing Problems

This course discusses swallowing problems with additional focuses on pediatric feeding difficulties. It covers on methods of assessment and principles of interventions in managing individuals with swallowing problems. This course is taught via lecture, tutorial, and practical session. Students are assessed through assignment, test and final examination.

List of text/reference books:

1. Groher, M. & Crary, M., *Dysphagia: Clinical Management in Adults and Children*. Florida: Elsevier, 2009.
2. Leonard, R. & Kendall, K., *Dysphagia Assessment and Treatment Planning: A Team Approach* (2nd Ed.). New York: Thomson Delmar Learning, 2007.
3. Carrau, R.L. & Murry, T., *Comprehensive Management of Swallowing Disorders* (2nd Ed.). San Diego. Singular Publishing Group, 2006.

GTS305/2-Applied Sports Physiology

This course introduces student to physiological changes due to environment, training method, time and age. This course also discusses issues related to sport performance including sports in hot and cold environment, altitude training, circadian rhythm and jet lag. This course will also cover water-based physiological changes due to physical activities and the effects of pollution (air, noise) on exercise physiology conditions. This course will be taught via lecture and tutorial. Students will be assessed through assignment, test and final examination.

List of text/reference books:

1. Reilly, T. & Waterhouse, J., *Sport, Exercise and Environmental Physiology*. Elsevier Churchill Livingstone, 2005.
2. Tipton, C.M., Sawka, M.N., Tate C.A. & Terjung R.L. (Eds), *ACSM's Advanced Exercise Physiology*. Philadelphia: Lippincott Williams & Wilkins, 2006.
3. Powers, S.K. & Howley, E.T., *Exercise Physiology Theory and Application to Fitness and Performance* (7th Ed.). McGraw-Hill, 2012.
4. Armstrong N. (Ed.), *Pediatric Exercise Physiology*. New York: Churchill Livingstone, 2007.

GTS307/3- Physical Activity, Growth and Development

This course exposes the students to issues related to physical growth and development with regards to physical activity. Discussion on the maturation process, morphological and functional changes in relation to exercise and training will be conducted.

List of text/reference books:

1. Thies, K.M. & Travers, J.F., *Growth and Development through the Lifespan* (2nd Ed.). Sudbury, MA: Jones and Bartlett Publishers, 2009.
2. Malina, R.M., Bar-Or, O. & Bouchard, C., *Growth, Maturation and Physical Activity* (2nd Ed.). Champaign, IL: Human Kinetics, 2001.
3. Jurimae, T. & Hills, A.P., *Body Composition Assessment in Children and Adolescents*. Karger, 2001.

GTS311/3-Sports Nutrition

Students will be exposed to the knowledge of nutritional requirement for the athletes in various disciplines, nutritional requirement to different sport event and ergogenic aids to enhance sport performance. Students will learn about nutritional planning in pre, during and post-performance/training.

List of text/reference books:

1. Antonio, J., *Essential of Sports Nutrition and Supplements*. Totowa, NJ: Humana Press, 2008.
2. Clark, N., *Nancy Clark's Sports Nutrition Guidebook* (5th Ed.). Champaign, IL: Human Kinetics, 2014.
3. McArdle, W.D., Katch, F.I., Katch, V.L., *Exercise Physiology: Energy, Nutrition, and Human Performance*. Philadelphia, PA: Williams & Wilkins, 2004.
4. Jeukendrup, A.E. & Gleeson, M., *Sports Nutrition: An Introduction to Energy Production and Performance* (2nd Ed.). Champaign, IL: Human Kinetics, 2010.

GTS312/3-Sports Injuries and Rehabilitation

This course introduces students to the types and mechanisms of injuries in sports. It also covers the principles of rehabilitation process including the use of equipments for the treatment and therapies in sports injuries. This course will be taught via lectures and practical that integrates fundamental knowledge with current research outcomes. Students will be assessed through tests, practical reports and final examination.

List of text/reference books:

1. Abrahamson, E. And Comfort, P., *Sports Rehabilitation and Injury Prevention*. Chichester, West Sussex: Wiley-Blackwell, 2010.
2. Buschbacher R.M., Dave S.J. & Prahlow N.D., *Sports Medicine and Rehabilitation: A Sport Specific Approach* (2nd Ed.). Philadelphia, PA: Lippincott Williams & Wilkins, 2009.
3. Prentice, W.E. (Ed), *Rehabilitation Technique in Sports Medicine* (3rd Ed.). McGraw Hill, 1999.
4. Selvanetti, A., Giombini, A. & Puddu, G., *Rehabilitation of Sports Injuries*. New York: Springer-Verlag Berlin Heidelberg. 2001.
5. Denegar, C.R., Saliba, E. & Saliba, S.F., *Therapeutic Modalities for Musculoskeletal Injuries* (3rd Ed.). Champaign, IL: Human Kinetics, 2010.

GTS313/3-Sports Biomechanics and Kinesiology

This course introduces the interdisciplinary knowledge about the anatomy of the skeletal-muscle and neuro-muscular structure integrated with biomechanic principles. The knowledge helps to understand the functions and limitations of the systems, comprehend the types and causes of movement in sports and to analyse body motion. The course will focus on the development techniques of human motion analysis from the aspect of structure and function as well as the applied biomechanics principles involved in human movement. Examples from joint movements and application of sports skills will be used for the analyses.

List of text/reference books:

1. Hamilton, N., Welmar, W. & Luttgens, K., *Kinesiology: Scientific Basis for Human Motion* (11th Ed.). Boston: McGraw-Hill Higher Education, 2008
2. Bartlett, R. & Hong, Y., *Handbook of Biomechanics and Human Movement Science*. London, NY: Routledge, 2008.
3. Bartlett, R. & Bussey, M., *Sports Biomechanics: Reducing Injury Risk and Improving Sports Performance* (2nd Ed.). London: Routledge, 2012.
4. Hall S.J., *Basic Biomechanics* (6th Ed.). New York: McGraw-Hill, 2011.

GTS314/3-Motor Learning

This course introduces students to basic concepts and theories of motor learning. This course also introduces students to research studies that utilize an interdisciplinary approach of perceptual-motor process and psychological mechanism of motor learning in sports. This course will be taught via lecture and practical. Students will be assessed through test, assignment and final examination.

List of text/reference books:

1. Magill, R.A., *Motor Learning: Concepts and Applications* (11th Ed.). Columbus, OH: McGraw-Hill, 2011.
2. Coker, C.A., *Motor Learning and Control for Practitioners* (2nd Ed.). New York: McGraw-Hill, 2009.
3. Schmidt, R., *Motor Control and Learning: A Behavioral Emphasis* (5th Ed.). Champaign, IL: Human Kinetics, 2008.
4. Schmidt, R. & Wrisberg, C., *Motor Learning and Performance: A Problem-Based Learning Approach* (3rd Ed.). Champaign, IL : Human Kinetics, 2004.

GTS315/3-Coaching Science and Performance Analysis

This course introduces the students to the multidisciplinary aspect of sport sciences (anatomy, physiology, psychology, biomechanics, and skill acquisition) that are important for coaches. It also emphasises on the sustainable management, efficient planning and social-interpersonal skills required by the modern coach. The course also covers advanced coaching means and methods, theoretical and practical aspects of planning, periodisation, forecasting and target setting in order to analyse sports performance.

List of text/reference books:

1. Martens, R., *Successful Coaching* (3rd Ed.). Champaign, IL: Human Kinetics, 2004.
2. Robinson, P.E., *Foundations of Sports Coaching*. New York, NY: Routledge, 2010.
3. McMorris, T. & Hale, T. *Coaching Science: Theory Into Practice*. John Wiley & Sons, 2006.
4. Hughes, M., Jones, R.L. & Kinston K., *An Introduction to Sports Coaching: From Science and Theory to Practice*. London, NY: Routledge, 2008.

GTS316/3-Adapted Physical Activity

This course is designed to impart knowledge and skills about sports and people with disabilities. Students are introduced on the conceptual foundation about people with disabilities, types of people with disabilities, health and fitness, as well as the relationship of healthy life styles and health conditions. The course further promotes knowledge that may improve the health and quality of life of people with disabilities, in terms self-help skills, productivity and psychological through empowerment of people with disabilities in recreational and physical activities.

List of text/reference books:

1. Claudine, S., *Adapted Physical Activity, Recreation, and Sport: Crossdisciplinary and Lifespan* (6th Ed.). Boston, MA: McGraw-Hill, 2004.
2. Thomas, N. & Smith, A., *Disability, Sport and Society: An Introduction*. London: Routledge, 2009.
3. Thompson, W.R. & Vanlandewijck, Y., *The Paralympic Athlete: Handbook of Sports Medicine and Science*. West-Sussex: Wiley-Blackwell, 2011.

GTS317/3-Sports Management

This course explores the basics of sports organisation, hierarchy of sports organisation and their role in community engagement, networking, and integrated administration to ensure equality, quality of life and sustainable partnership between diverse sectors of society through the development of sports. Basic management of physical education and sports plus the detailed explanation of management and running of various physical education and sports programme will be introduced.

List of text/reference books:

1. Hoye R, Smith A, Nicholson M, Stewart B, Westerbeek H. Sport management: Principles and application. Oxon, Routledge, 2012.
2. Krotee, M.L. & Bucher, C.A., *Management of Physical Education and Sports* (13th Ed.). Boston, MA: McGraw-Hill, 2007.
3. Lussier, R.N., Kimball, D.C. & Lussier, R.N., *Applied Sports Management Skills*. Champaign, IL: Human Kinetics, 2009.
4. Emery, P., *The Sports Management Toolkit*. Abingdon, Oxon: Routledge, 2011.

GTX307/3-Radiation Protection and Safety II

This course is the continuity of Radiation Protection and Safety I course. This course aims to provide theoretical and practical knowledge regarding the best practice of radiation protection on diagnostic radiology, radiotherapy and nuclear medicine as well as researches involving radiation and radioactive waste management. Teaching and learning activities for this course is delivered through lectures, tutorials and practical demonstrations to provide sustainable knowledge to the students. Students will be assessed through assignments, test, practical assessment and final examination.

List of text/reference books:

1. Ismail Bahari & Mohd Yusof Ismail, *Managing Radiation Safety*. Atomic Energy Licensing Board (AELB) McGraw-Hill, 2007.
2. Statkiewicz Sherer, M.A., Visconti, P.J. & Ritenour, E.R., *Radiation Protection in Medical Radiography* (5th Ed.). Mosby, 2006.
3. Lombardi, M.H., *Radiation Protection in Nuclear Medicine* (2nd Ed.). CRC, 2006.

GTX321/4-Imaging Techniques I

This course introduces students to a sustainable clinical exercise in the hospital pertaining to imaging techniques in general radiography, emergency radiography, dental radiography and fluoroscopy. It also covers the procedures on handling a modality, radiation protection practice, patient care and management, and good communication skill. This course will be conducted via lecture/practicum/SCL. The students will be assessed through practical assessment, log book, presentations, practical exercise and final examination.

List of text/reference books:

1. Greathouse, J.S., *Radiographic Positioning and Procedures: A Comprehensive Approach*. Delmar Learning, 2006.
2. Bontrager, K.L. & Lampignano, J.P., *Textbook of Radiographic Positioning and Related Anatomy* (7th Ed.). Elsevier Mosby, 2010.
3. Sutherland, R. & Thomson C., *Pocketbook of Radiographic Positioning* (3rd Ed.). Churchill Livingstone, 2007.

GTX322/3-Radiation Protection and Safety I

This course is aimed to provide the students knowledge regarding biological effects of ionizing radiation as well as fundamentals of radiation protection. This course discuss the regulatory acts regarding the use of radiation and radiation safety in Malaysia especially the Atomic Energy Licensing Act (1984). This course also discusses the Radiation Protection Program as recommended by Atomic Energy Licensing Board (AELB) to give awareness on students regarding occupational health and safety involving ionising radiation. Students will be taught theoretically and through practical regarding basic principles in radiation protection. Students will be evaluated through quiz, assignments, practical report and final examination.

List of text/reference books:

1. Ismail, B. & Mohd. Yusof, M.A., *Managing Radiation Safety: Guide for Radiation Protection Officers*. McGraw Hill, 2007.
2. The Government of Malaysia, Atomic Energy Licensing 1984, Act 304: *Basic Safety Standard (2010), Licensing (1986) and Transportation (1989)*.
3. Martin, A. & Harbison, S.A., *An Introduction to Radiation Protection* (5th Ed.). A Hodder Arnold Publication, 2006.

GTX323/3-Introduction to Radiation Dosimetry

This is an introductory course to the fundamental principles of radiation dosimetry which includes basic radiation physics, production of x-ray, interactionof radiation, radiation measurement equipment and clinical beam calibration. This course will be conducted through lecture, tutorial and seminar. Student will be evaluated through test, quiz, assignment and final examination.

List of text/reference books:

1. Hendee, W.R. & Ibbott, G.S., *Radiation Therapy Physics* (3rd Ed.). John Wiley and Sons Inc., 2003.
2. Washington, C.M. & Leaver, D.T., *Principles and Practice of Radiation Therapy* (2nd Ed.). Mosby, 2004.
3. Khan F.M., *The Physics of Radiation Therapy* (4th Ed.). Lippincott Williams & Wilkins, 2010.

GTX324/4-Diagnostic Radiology Imaging

This course introduces students to the knowledge and practice in mammography, fluoroscopy, digital radiology, digital subtraction angiography (DSA), CT scan and MRI. It also covers quality assurance programmes, regulations on the use of radiation equipment and practical radiation protection. This course will be conducted via lecture/tutorial/SCL. The students will be assessed through continuous assessments, assignment, exercise of tutorial, field report, presentation and final examination.

List of text/reference books:

1. Carlton, R.R. & Adler, A.M., *Principles of Radiographic Imaging: An Art and A Science* (4th Ed.). Thomson Delmar Learning, 2006.
2. Bushberg, J.T., Seibert, J.A., Leidholdt, E.M. & Boone, J.M., *Essential Physics of Medical Imaging* (3rd Ed.). Lippincott Williams & Wilkins, 2012.
3. Allisy-Roberts, P., *Farr's Physics for Medical Imaging* (2nd Ed.). Elsevier, 2008.

GTX325/4-Nuclear Medicine Imaging

This course introduces students to the in-vivo radiation detection in health and the major components of imaging equipment including gamma camera and PET scanner. Image formation in nuclear medicine imaging with the performance parameters for both gamma camera and PET scanner and quality assurance will be discussed. Students will be taught the imaging techniques of both gamma camera and PET scanner. The course will be conducted via lecture and tutorial. The students will be assessed through test, assignment, presentation and final examination.

List of text/reference books:

1. Prekeges, J., *Nuclear Medicine Instrumentation* (2nd Ed.). Jones & Bartlett Learning, 2013.
2. Bushberg, J.T., Seibert, J.A., Leidholdt, E.M. & Boone, J.M., *Essential Physics of Medical Imaging* (3rd Ed.). Lippincott Williams & Wilkins, 2012.
3. Cherry, S.R., Sorenson, J.A. & Phelps, M.E., *Physics in Nuclear Medicine*, (4th Ed.). Elsevier, 2012.

GTX326/4-Principles of Radiotherapy

This is an introductory course for the student to the fundamental principles of radiotherapy which including basic concept of radiotherapy technique, clinical radiotherapy machine, dose calculation and radiation beam calibration in clinical environment. This course will be conducted through lecture, tutorial and seminar. Student will be evaluated through test, quiz, assignment and final examination.

List of text/reference books:

1. Khan, F.M., *The Physics of Radiation Therapy* (4th Ed.). Lippincott Williams & Wilkins, 2010.
2. Symonds, P., Deehan, C. & Meredith C., *Walter and Miller's Textbook of Radiotherapy: Radiation Physics, Therapy and Oncology* (7th Ed.). Churchill Livingstone, 2012.
3. Washington, C.M. & Leaver, D.T., *Principles and Practice of Radiation Therapy* (3rd Ed.). Mosby, 2010.

GTX327/3-Brachytherapy

This course discusses fundamental knowledge of physics and dosimetry aspects of brachytherapy. Radioactive sources commonly used in brachytherapy and types of brachytherapy will also be discussed. The course will be conducted via lecture and tutorial. The students will be assessed through test, quiz, assignment and final examination.

List of text/reference books:

1. Hoskin P. and Coyle C., *Radiotherapy in Practice: Brachytherapy* (2nd Ed.). Oxford, 2011.
2. Washington, C.M. & Leaver, D.T., *Principles and Practice of Radiation Therapy* (3rd Ed.). Mosby, 2010.
3. Khan F.M., *The Physics of Radiation Therapy* (4th Ed.). Lippincott Williams & Wilkins, 2010.