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Competency-Based Education: Implications for Curricular Development of the Allied Dental Science Program at the Jordan University of Science and Technology

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Preface

The content of this document represents a review of the best practices and principles in competency-based dental and allied dental education. This information is offered in the spirit of collegiality with the intent of improving the allied dental education in general and the dental hygiene education in particular in Jordan. Recommendations presented should serve as a basis for discussion and decision-making by all involved in the Allied Dental Science Program education and administration at the Jordan University of Science and Technology, including the Dean of the Applied Medical Sciences Department and the Allied Dental Science Program Director and Faculty.

EXECUTIVE SUMMARY

Competency-Based Education: Implications for Curricular Development of the Allied Dental Science Program at the Jordan University of Science and Technology

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This document reviews the best practices and principles in competency-based dental and allied dental education that can be used to improve the dental hygiene curriculum of the ADS program at JUST, and to develop the dental hygiene profession in Jordan by graduating competent entry-level dental hygienists. The main purpose is to encourage ADS curriculum revision and to propose a competency-based curriculum development plan that can be used by the ADS director and faculty. Competency-based education is defined as education based on a curriculum planned and organized from an analysis of a practitioner's actual roles and responsibilities in modern society. Competency-based education proposed that learning to become competent is a progression through the five stages of the competency continuum: novice, beginner, competent, proficient, and expert. Different learner's characteristics at each phase suggest that variant learning and evaluation strategies must be used, at each learning level, and sequentially arranged to help students progress through the five stages of the competency continuum. In competency-based education, three fundamental questions must be addressed by educators: what competencies must graduates possess as entry-level professionals, what learning experiences and curriculum content will help students attain these competencies, and what evaluation methods are appropriate to assess students competencies? Four features characterize and differentiate competency-based education

from other education types: clear definition of the competencies that students must acquire once they graduate from the program, curriculum aligned with and centered around the competencies, sequentially arranged learning activities to move students logically along the competency continuum, and performance-based evaluation methods that assess student competence.

The historical evolution of competency-based education shows that the transition of dental and allied dental educational programs from discipline-based to competency-based education began with the AADS House of Delegates resolution in 1991 that called educational programs to focus on competency-based curriculum development. In 1993, the AADS established a new strategy for curriculum designation based on the competencies that students need for entry-level practice. Competency-based education provides a framework that ensures the interdisciplinary integration of the foundational knowledge, skills, and values (the components of competency) necessary to master a particular competency. For allied dental programs, competency-based education assists in defining the evolving roles of allied dental professionals in the delivery of care; identifying national competencies and evaluating program effectiveness against these competencies; and defining an overall curriculum management plan for planning, revising, implementing, and improving the curriculum. Competency-based evaluation means the elimination of requirement-based clinical evaluation and daily grades and hence reducing the number of process repetitions needed and increasing the time for a greater variety of clinical experiences. Competency-based curriculum development is a top-down process that begins with clearly defined competencies and works backward to

create learning experiences, courses content, and learning sequences centered on these competencies.

In 1998, the Commission on Dental Accreditation revised the accreditation standards that requested the dental hygiene programs in the US to identify the competencies they want their graduates to attain once they graduate and to utilize competency-based evaluation mechanisms to assess the students' competencies and program's effectiveness. In the same year, the AADS proposed a document where competencies for entry into the profession of dental hygiene were identified to guide dental hygiene programs in defining their own competencies.

Currently in Jordan, the ADS educational program is a discipline, content-based curriculum where students start practicing and providing dental hygiene services to patients in the first semester of the fourth year. No accreditation standards, specified requirements or competencies exist for the ADS program. Dentists rather than dental hygienists educate dental hygienists and administer the program. A proposed competency-based dental hygiene curriculum plan and competency document for the ADS program are presented in this paper. Key elements of this plan consist of adopting a dental hygiene competency document for the ADS program, creating an evaluation plan and strategies appropriate to assess students competencies, identifying learning activities that help students attain program competencies, and defining the overall curriculum content and design around the competencies. For that purpose, a proposed dental hygiene competency document is presented in this document, modified from the competency documents of the dental hygiene programs at the Old Dominion University, the Texas A and M University, and the AADS document, "*Competencies for the Entry-level Dental*

Hygienist". Pre-clinical theoretical and practical dental hygiene courses outlines and descriptions are also developed as models based on the reviewed best principles and practices of competency-based education. Specific recommendations include:

- Change the ADS program from the traditional discipline, content-based education to competency-based education.
- Use the three-step CB curriculum development process established by Dewald and McCann (1999) as a model to develop a Dental Hygiene Competency-Based curriculum for the ADS program at the JUST.
- Establish a curriculum development committee to introduce the ADS faculty and course directors to the competency-based education principles:
    - ask the ADS educators to answer 3 main questions: what competencies do you teach, what topics do you teach in support of those competencies, and what methods do you use to evaluate the competencies?
    - review and use the answers to the above questions to develop a comprehensive evaluation plan and curriculum document, with content linked to the supporting competencies.
    - revise the current ADS curriculum, including course content, sequencing, and course outlines
    - perform modifications that are consistent with the competency-based curriculum development
    - align the curriculum content and sequence with the competencies.
- Incorporate the existing evaluation methods as well as new student assessment strategies that are competency-based into the evaluation plan.

- Establish accreditation standards for the ADS educational program to ensure high quality competent graduates who are able to practice safely and ethically in real work settings.
- Ensure students and faculty understanding of the competency statements by:
    - introducing students enrolled in the ADS program into the competency document during the orientation process so that they will know what they will achieve in their dental hygiene and dental assisting education.
    - reviewing the overall curriculum competencies by the course directors and identifying the competencies they will teach and evaluate in their courses.
    - stating the competencies in a language that is clear to all students and faculty. The competencies should be stated in every course syllabus and reviewed at the beginning of each course.
- Assess the ADS program effectiveness annually (curriculum management plan) using program assessment surveys, completed by students, faculty, and patients, students' course completion results, and students' evaluation of courses.
- Change the current ADS program's clinical evaluation system, which is requirement and daily grading-based, to be summative and performance-based.
- Relate annual students' performance results to the program outcomes assessment.
- Develop and use active, realistic learning strategies in the classroom, e.g., small group learning exercises, paper projects, case presentation, patient cases for assessment and teaching, etc.

- Use reinforcement and detailed feedback as well as self and peer-evaluations as clinical learning and evaluation strategies.
- Establish pre-clinical laboratory dental hygiene courses that help students learn the foundational skills. Students could work and practice on each other and on models since no laboratory setting or head-forms are available for the ADS program.

This paper is of particular value for the ADS program to move from discipline-based to competency-based education to graduate competent entry-level dental hygienists, able to provide safe and effective therapeutic and preventive services to Jordanian citizens. It is the responsibility of educational programs to graduate competent professionals and competency-based education is one, strongly, by which competence is achieved.

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Dedication

In the memory of my brothers and sisters in Islam, Iraqi, Palestinian, and Aphgani Muslims, who are the victims of the current war and world's injustice … May ALLAH bless you all, accept your Shahada, and enter you in his paradise … Amine. The only thing we can do for you is to pray and ask ALLAH to protect Iraq, Aphganistan, and all Arab and Muslim countries everywhere and anytime

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INTRODUCTION

In 1996 the Jordan University of Science and Technology (JUST) opened the Allied Dental Science program (ADS), leading to the Bachelor's of Science degree in dental assisting and dental hygiene. The establishment of this program was a response to the increased demand of the Jordanian market for allied dental professionals- dental assistants, dental hygienists, and dental technologists- who are prepared to provide services, particularly at the JUST Educational Dental Health Center. ADS program was one of a number of new programs that JUST started in the same year to expand career opportunities to Jordanian students.

The first ten students graduated from the ADS program in 2000; eight students graduated in 2001 and another eight students graduated in 2002. Most graduates work at the JUST-Educational Dental Health Center. One is employed in a government health center. No dental hygienists are employed in schools, hospitals or other public health settings. Three graduates from the class of 2000 received scholarships from JUST to pursue higher graduate study in dental hygiene, with emphasis on teaching, research, and education. Those three students, once finished with graduate study, will return to JUST as faculty members of the ADS program.

As of 2002, the number of dental hygienists in Jordan reached 30; however, job opportunities for dental hygienists are few. Because the dental hygiene profession is new, people, including dentists and the government's educational and health ministries, have limited understanding of the role dental hygienists can play in raising the oral and systemic health of Jordanian citizens. Most of them do not know about dental hygienists, their roles and responsibilities, or where dental hygienists can work. Educational and

health departments do not value dental hygienists with bachelor's degrees, nor their roles in promoting oral health and preventing dental diseases. Most do not accept dental hygienists as members of the oral care team and debate their scope of practice.

To graduate, students in the ADS program must successfully complete a minimum of 129 credit hours as follows: 25 hours university requirements, 44 hours faculty requirements, and 60 hours department requirements (See Appendix A). The university requirements include 16 hours in general education courses such as English and Arabic languages, introduction to computer science, and military sciences, and 9 credit hours as elective courses. Faculty of Applied Medical Sciences requirements involve basic science courses such as chemistry, biology and physics, and health science courses such as anatomy, physiology and microbiology (Jordan University of Science and Technology, 2001).

Students must finish most of the university and faculty requirements in addition to some of the department requirements in dental materials, dental morphology and occlusion during the first and second years of the program. In the third year, students are introduced to the dental, dental assisting, and dental hygiene professions via courses in oral surgery, pediatrics, orthodontics, periodontics, and clinical dentistry, dental assisting and dental hygiene by observing dental students and employed dental assistants in the clinics. In the second semester of the third year, students start their clinical dental assisting practice with the dental students and are introduced to clinical dental hygiene.

In the fourth year, ADS students practice the dental hygiene process of care including dental hygiene assessment, diagnosis, planning, implementation, and evaluation. However, there are no predetermined requirements of the number, type of

patients, or procedures students must finish each semester or criteria for the achievement of competencies. No articulation occurs between didactic and clinical courses. There is a shortage of qualified faculty who specialize in dental hygiene and dental assisting; therefore, dentists rather than dental hygienists teach both theoretical and clinical courses to the ADS students. The program depends on faculty who are not graduates of dental hygiene programs and who have never employed a dental hygienist. Dentists rather than dental hygienists administer the ADS program.

As of 2003, no accreditation standards, specified criteria, requirements or competencies exist regarding the ADS curriculum. Moreover, no licensure requirements, external comprehensive examinations or mandatory continuing education requirements are established for ADS graduates. Since 1996, curricular improvements and changes have been implemented, including courses, credit hours and courses' content. Faculty continues to debate issues of curriculum content to ensure competent dental hygiene graduates and to define the role of the dental hygienist in Jordan. This is natural since the program is new and its faculty members are not dental hygienists and dental assistants.

Revision and improvement must continue on the ADS curriculum with specific emphasis on core dental hygiene and dental assisting' competencies. As a first step in ADS program enhancement and professional development, graduates must have educational experiences that prepared them for independent practice and the six roles of the dental hygienists as oral health educators/promoters, researchers, change agents, managers/ administrators, clinicians, and consumer advocates (ADHA, 2000; ADHA Dental Hygiene Fact Sheet; Darby & Walsh, 1995).

The purpose of this paper is to review the literature on competency-based dental and dental hygiene education and competency based curriculum development, and revise two dental hygiene courses' descriptions and outlines based on best practices found in the literature. As such, the paper serves as a suggested plan and first step toward the development of a competency-based ADS curriculum at JUST. This paper will also help ADS educators identify and develop evaluation and teaching strategies appropriate for dental hygiene competencies' assessment.

Definition of Key Terms

Competency-based education (CBE): A type of education based on a curriculum designed from an analysis of a practitioner's actual role in modern society. Learning experiences are planned to progress students through the stages of the competency continuum. Different instructional and evaluation strategies are used as appropriate at each level of learning and professional growth, and the entire sequence is coordinated to bring into being a competent beginning practitioner. Progress toward competence is based on demonstrated performance in some or all aspects of the practitioner role (Hendricson & Kleffner, 1998; Chambers & Glassman, 1997).

Competency-based curriculum: A curriculum focused on the competencies that students must attain to start practice independently in real-life settings and as entry-level professionals.

Competence: A universal, complex concept consisting of cognitive understanding, experience, problem-solving skill attained from accumulated knowledge, intellectual growth, self-confidence, professional and ethical values, and motor skill proficiency (Hendricson & Kleffner, 1998).

Competencies: Skills, attitudes and behaviors that students must attain to be entry-level practitioners. Competencies integrate essential knowledge, skills, and professional values and are performed independently in natural settings. Competencies are what professionals do on a regular basis to meet patients' needs. Competencies are written as statements reflecting the measurable skills needed to begin independent practice in natural settings.

Competency continuum: Five phases through which learners progress over a 10 to 15-year period, as they become professionals: novice, beginner, competent, expert, and proficient stages. CBE assumes that learning to become competent is a progression through the competency continuum phases.

Major competency: The ability to perform a particular, complex service or task that is cognitive, affective, and/or psychomotor in nature (Conny, 1994).

Supporting competencies: Specific abilities that must be acquired to enable the performance of any major competency (Conny, 1994).

Foundational abilities: Foundational knowledge, skills, and attitudes that are attained through didactic, laboratory/pre-clinical, and clinical instruction and are required for satisfactory mastery of the supporting competencies (Conny, 1994).

Foundational knowledge: The ability to recite and apply the information and correctly answering questions on written, oral, or practical tests. The degree of information and understanding students attain in beginning courses in subjects such as dental materials and microbiology that are essential for competency development (Chambers, 1993).

Foundational skill: The ability to perform a particular skill according to established guidelines or a prescribed process in standardized conditions, such as charting and

recording probing depths and bleeding points on a partner, or performing fissure sealants on a model in a laboratory setting, e.g., the psychomotor skills that are developed in pre-clinical laboratories under standardized conditions prior to competency achievement (Chambers, 1993).

Foundational attitude: A positive, acceptable intellectual and behavioral action, such as appreciate individual differences and cultural diversity, treat all individuals and populations without discrimination, and maintain patients' confidentiality and privacy.

Competency document: Clearly identified entry-level competencies that the program wants their graduate to possess once they graduate.

Herarichary arranged learning experiences/modules: Teaching and learning methods that are sequentially arranged to help students move through out the competency continuum stages such as small group projects, research papers, library and online search, case studies, problem-based learning activities, oral presentation, community experience/ practicum, etc. Education Methods linked to specific (supporting) competencies.

Evaluation system: Evaluation strategies that assess students as they move along the five stages of the competency continuum. Written examinations are appropriate to assess novice learners, simulations/practical examinations under laboratory/pre-clinical (ideal) conditions are appropriate to assess beginners, and authentic, performance/process-based evaluations (e.g. case tests and presentations, Exit Senior Exam, mock board exams) must be used to assess students' competencies, in setting similar to real work settings.

Evaluation plan document: A document that shows <u>when</u> (course) and <u>how</u> each supporting competency will be learned and evaluated. Evaluation Methods linked to specific (supporting) competencies.

Top-down curriculum organization and development: Curriculum content and sequence defined in terms of the program's competencies. The process of curriculum development begins with the identified competencies and works backward to establish learning activities that help students attain the competencies.

Curriculum management plan: Annual assessment of the program effectiveness and outcomes including graduates' competencies and curriculum content and sequence. Evaluation methods that could be used: patient surveys, students' evaluation of courses, and students' course completion. Changes and improvements are implemented accordingly.

Curriculum inventory: A document that outlines the entire curriculum in terms of the supporting competencies.

REVIEW OF THE LITERATURE

To improve the dental hygiene clinical curriculum at JUST, the literature on competency-based education was reviewed and applied. This review covers the following areas: the historical evolution of competency-based education, competency-based education defined, advantages and disadvantages of competency-based education, discipline-based versus competency-based curricula, competency-based evaluation techniques, and the implications of competency-based education for dental and allied dental education.

Historical Evolution of Competency-based Education (CBE)

Interest in competencies that practitioners must acquire to begin practice in natural life settings is not new. " There has been a long-term trend of professional education away from a technical-rational model toward one focused on questions of readiness for practice" (Marchese, 1994). According to Marchese (1994), consideration of professional efficiency began in the1930s with Henry Murray's investigations at Harvard. Such interests were expanded by the introduction of patient-based teaching of clinical medicine at Case Western Reserve University, problem-based learning at McMaster University's Medical School, and the new pathways program at the Harvard Medical School in 1982 (Marchese, 1994).

In dental and allied dental education, movement from disciplinary/ content/ subject-based curricula to competency-based curricula began with the American Association of Dental Schools (AADS) House of Delegates Resolution in 1991 that called for a new system of curriculum guidelines, one that is more interdisciplinary and competency based (Devore, 1994). As a result, the AADS conducted a curriculum

forum, " *Focus on Competencies: Defining the Outcomes of Dental and Allied Dental Education in the Nineties,*" that oriented dental educators to the concept of competencies and how to integrate them into curricula (Devore, 1994). Chambers (1993) stated that "Dental and allied dental curricula must be characterized in terms of their impact on students (expressed as competencies) rather than discipline-based content (expressed as instructional objectives)". In 1993, the AADS recommended a new strategy for curriculum designation based on the competencies students need for entry-level practice (Dewald & McCann, 1999; Devore, 1994).

According to Marchese (1994), many factors lead to the competency-based education movement: changes in society and public's expectations, advances in psychology and cognitive sciences, and changes in educators' responsibilities. The increased expectation of the public and employers for professionals to be competent was one of these factors. The public wants a process of care that is safe, effective, and of high quality. Another factor was the increased interests of policy and decision-makers as well as the public in the licensing and certification processes to ensure highly qualified entry-level professionals. Moreover, educators became more aware of learning-teaching principles and the characteristics of adult learners due to the new teaching theories and philosophies, such as behavioral and Gestalt theories, that explain how learning occurs. This increased understanding helped teachers to find and utilize effective teaching and evaluation methods to facilitate student learning. Much was also discovered about the concept of competence and of how to develop competencies (Marchese, 1994). For example, educators recognized that competencies require integration of basic intellectual,

technical, and interpersonal skills and that learning to become competent is a progression through stages.

Factors related to educational changes, and the goals and assumptions directing the educational process played an important role in the CBE trend, e.g., looking at teaching as learning represents a historical shift in the educational process away from teacher-centered to student-centered learning, and augments both teacher and student responsibility for the learning outcome (Marchese, 1994).

Competency-based Education Defined

In competency-based education, learning to become a professional is a succession through five different stages: novice, beginner, competent, proficient, and expert. These five stages together form the *competency continuum* through which learners progress over a 10 to 15-year period to become experts (See Figure 1) (Chambers & Glassman, 1997; Hendricson & Kleffner, 1998; Chambers, 1994). Figure 1 displays the "Three Ps" model (Prepare, Practice, and Perfect), which expresses the educational activities that promote learning at each phase as well as the characteristics and differences among the novice, competent, and expert stages of the competency continuum.

P
E **EXPERT** (Unconcious competent)
R
F * Ten years escalating experience
E
C **COMPETENT** (Conscious competent; ready
T for unsupervised practice)

* entry-level competency certified
P * Learner-teacher mutually assess readiness
R * Instructor assistance gradually weaned
A * Repetitive practice with varied problems/tasks
C * Instructors give encouragement and positive support
T * Continued emphasis on learner self-critique
I * Increased use of realistic and varied work settings
C
E **NOVICE** (Conscious incompetent)

* Learners rewarded for candid self-assessment
P * Detailed, non-graded formative feedback by instructors
R * Active instructor coaching during skills performance
E * Assisted practice in controlled, distraction-free settings
P * Learners observe practitioners performing competencies
A * Demonstrate ability to apply foundation standards in simulations
R * Integrative, case-based (problem-centered) learning experiences
E * Acquire cognitive foundations: standards, rules, application guidance
* Observe examples of exemplary competency performances
* Orientation to competencies and sub-ordinate components

CANDIDATE (Unconscious Incompetent)

* Enthusiastic, but naive about difficulty of learning tasks ahead
* Unaware of limitations
* Demonstrates appropriate pre-matriculation performance

Figure 1. Phases and Events of Novice-expert Learning Continuum (Fischman, 1982; Hagman, 1983; Johnson, 1984; Schneider, 1985; Druckman & Bjork, 1991; Carry & Wergin, 1993; Hendricson & Kleffner, 1998).

Understanding the learner's characteristics at each stage is very important for competency-based program's educators. Such knowledge assists educators in identifying and developing learning activities and evaluation methods that are most appropriate at each phase of learning. Novice learners are characterized by behaviors such as control over basics, isolated knowledge and skills that represent the foundation to develop to the next stages, and dependence on faculty for identifying the appropriate performance,

conditions, and clinical outcomes. At the novice stage, also known as preparation phase, learners are introduced to the competencies, observe examples and models of accepted performance and products, and acquire foundational knowledge and skills necessary to master competencies.

According to Hendricson and Kleffner (1998), research on competency-based education and problem-based learning proposed that *case-based learning* is the best learning strategy through which foundational facts and skills could be achieved during the novice phase. In case-based learning, students can practice the application of foundational principles to patient problems at the novice stage. At the same time, novice students are introduced to the clinical practice by observing faculty performing procedures and practicing what they observe under direct, controlled, and supervised pre-clinical and laboratory conditions. The instructor's role at the novice phase is to supervise and assist students during practice and provide feedback and reinforcement for correct performances. Students are also encouraged to evaluate their own performance.

Novice learners are recognized as being *conscious incompetent*, which means that they are aware of the competencies they must attain, recognize their weaknesses and limitations, and understand that the way toward competence is long and tough. Learners at this phase are more likely to underestimate their performance and try to hide their weaknesses from instructors. Therefore, they may be frustrated and defensive, tend to adhere to the rules and guidelines, and reluctant to accept alternatives.

At the *beginner's phase*, the second level in competency learning, students are more able to apply what they had learned in ideal situations to new situations with some modifications of the guidelines and procedure. At the *competent phase*, learners

repeatedly practice and apply what they had learned in settings that are similar to real work conditions with varied patients' cases and problems. *Repetitive practice* is desirable to allow students to accomplish "automaticity," the keystone of expert performance. Instructors' guidance and supervision decreases and learners become more self-directed and independent. Students and teachers jointly assess readiness for transition to different and more advanced learning tasks. Self-evaluation and critique are recommended to help students assess their own performance and limitations. Instructors' feedback and reinforcement are also encouraged at this phase in order to facilitate learning. At the end of this learning level, students become "*conscious competent*," able to practice independently as entry-level practitioners in real-life settings (Chambers, 1993; Hendricson & Kleffner 1998).

Table 1 lists some of the changes that occur through the phases along the continuum of competency. From beginner to expert phases, learners become more conscious, self-directed, faster, more flexible, internally rewarded, less reliant on criteria, and more able to respond to a variety of practice conditions (Chambers, 1993).

Table 1. Characteristics of Transition from Beginners to Experts (Chambers, 1993)

Beginner →	**Novice** →	**Competent** →	**Proficient** →	**Expert**
Errors				Flawless
Slow, hesitant				Fast, fluid
Stiff, rigid				Easily modified
Upon request				Conformed to context
Role driven				Schema (pattern) driven
One method				Multiple methods (choice)
Extrinsically rewarded				Intrinsically rewarded
Teacher responsibility				Performer responsibility
Semi-conscious		Conscious		Semi-conscious
Free-standing				Integrated

Taking these changes into consideration, program directors have an important role in competency-based curriculum organization and management, including course content, selection, sequencing, and assuring faculty interaction about the overall curriculum. Documenting these changes also helps educators in identifying learning activities and evaluative feedback that augment student progress from one level to another.

In CBE, three questions must be addressed by educational programs: 1) what competencies (knowledge, skills, and values) must graduates possess as entry-level professionals? 2) what educational events and curriculum content will help students attain these competencies? and 3) what evaluation methods will assess students' competencies and program outcomes? (See Figure 2) (Hendricson & Kleffner, 1998).

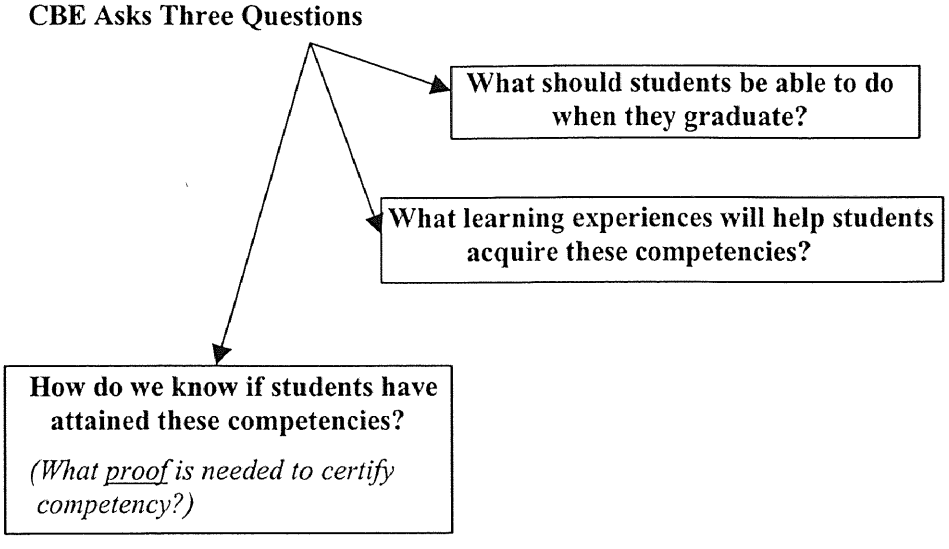

Figure 2. Fundamental Questions for Faculty in Competency-based Education (Hendricson & Kleffner, 1998).

According to Hendricson and Kleffner (1998), four characteristics or elements describe competency-based education and differentiate it from other educational systems: clear definition of the competencies that students must possess once they graduate from the program (discussed in a section on *Implications of CBE for Dental and Allied Dental*

Education), curriculum centered around the competencies that students must acquire as entry-level practitioners (discussed in a section on *Discipline-based versus Competency-based Curricula*), sequentially arranged learning activities to move students logically through the competency continuum, and performance-based assessment methods that evaluate students' competencies (discussed in a section on *Competency-based Evaluation Techniques*).

The third characteristic of competency-based education, each sequentially arranged, learning activities (modules), related to a particular competency. According to Hendricson and Kleffner (1998), learning modules usually involve several different learning activities, some required and some optional, with a focus on active learning. These modules are arranged to provide students with the foundational knowledge, skills, and values necessary to achieve designated competencies. Examples of these modules include: reading assignments, case-based seminars guided by faculty, individual or group research projects, video demonstrations, self-assessment practices, laboratory exercises, and supervised patient care practices. Learning modules are sequenced from a low to high level to allow students to progress at their own pace and have some freedom to choose from a number of optional learning exercises (Hendricson & Kleffner, 1998). Table 2 provides website information and resources that could be used by educators to access information on dental and dental hygiene competency-based education.

Advantages and Disadvantages of Competency-Based Education

In competency-based education, what students learn in an educational program is based on clearly stated competencies identified as being essential for successful independent practice in natural work settings. Beemsterboer (1994) highlighted the

Table 2: Website Information and Resources on Competency-based Education

Source	URL	Description
Assessment Center for Health Professions Education	http://www.tambcd.edu/assessment/net/html	Guides health professions educators toward assessment of student Competence, continuous program improvement and provides assessment resources
School of Dental Hygiene/ Old Dominion University, Norfolk, USA	http://www.odu.edu/dental	Competencies for the Baccalaureate Degree in Dental Hygiene Graduate
- American Dental Education Association, ADEA, USA (formerly American Association of Dental Schools, AADS)	http://www.adea.org	Information, publications, decisions on dental education including dental hygiene
	http://www.aads.jhu.edu	***Foundation Knowledge Working Document***. February 2, 1998: a template for competency-based curriculum inventory created by AADS. Organized by competency (highest level), domain (cognitive, psychomotor, & affective), and related topics.
- *Journal of Dental Education* Issued by ADEA - Assessment Center for Health Professions Education.	http://www.adea.org http://www.tambcd.edu/assessment	- Research articles and publications on Dental education including dental Dental hygiene education. E.g., ***-"Competencies for Entry into the Profession of Dental Hygiene"(1999), 63 (7), 526-530.*** ADEA
Untitled	http://www.udmercy.edu/dentalhygiene/ Compdoc.htm	***Competencies for the Dental Hygienist Document.***
American Dental Association/ Commission on Dental Accreditation	http://www.ada.org/prof/ed/accred/stand/ index.html	Accreditation Standards for Dental Education Programs.
	http://www.ada.org/prof/ed/accred/stand/ outcomes.pdf	***Outcomes Assessment Document:*** describe accreditation standards on educational programs' outcomes assessment where institutions are being asked to describe and document what their students have learned.
Baylor College of Dentistry/ Caruth School of Dental Hygiene. Dallas, Texas, USA	http://www.tambcd.edu/assessment/compdoc plain.html	***"Competencies for the dental hygienist"*** (June 1, 1994). Revised January 24, 1997.

necessity of identifying competencies as skills essential for dental hygiene, dental assisting, and dental laboratory technology. Students must be able to integrate the foundational knowledge, skills, and attitudes that they acquire in the beginning classes and pre-clinical laboratories to perform competencies (Beemsterboer, 1994). Therefore, competency-based education, if designed properly, affords a framework that ensures the integration of foundational knowledge, skills, and values to master a particular competency. Competency-based education assists in defining the evolving roles of allied dental professionals in the delivery of care; helps in identifying national competencies and assessing the effectiveness of existing allied dental education; and defines a system for planning, revising, implementing, and improving curriculum that responds to community needs and healthcare changes (Beemsterboer, 1994). In addition, competency-based education supports the development of interpersonal, technical, clinical, and problem-solving skills that students must develop to begin unsupervised practice in real-life settings (Tedesco, 1994).

Competencies usually signify the behaviors educators want their graduates to possess to begin independent practice. These competencies are supported by the instructional objectives teachers identify for each course as well as by course content (Beemsterboer 1994; Tedesco, 1994). The primary purpose of an educational program based on competency-based education is to prepare students with the competencies of their particular profession by providing them with the learning experiences and practices that permit the integration of the components of competence (knowledge, skills, and professional attitudes), with performance-based assessment methods that focused on the student's ability to perform the overall competency (Hendricson & Kleffner, 1998). The

major strength of competency-based education lies in the connection it assures between the educational preparation and actual professional practice in real settings. This type of education focuses on specific identified outcomes and on student's learning. Learning is the crucial factor, where students can progress at their pace (within limits) and can concentrate on what they need to learn to master competencies. Instructors and students are both aware of the outcomes and when to reach them (Marchase, 1994).

Competency-based education means the elimination of a requirement-based clinical curriculum and grading every procedure. This advantage may have important implications on the dental hygiene clinical curriculum content such as reducing the number of procedure repetitions needed, and allowing more time for a greater variety of clinical experiences. Requirement-based evaluation in the clinic is not effective in identifying and assessing students' competencies. Completion of a specific number of requirements does not signify that a student is competent. Students differ in their learning abilities. Some are competent with fewer procedures while others need more time. Moreover, daily clinical grades are usually formative in nature and reflect teacher intervention; therefore, such evaluations do not discriminate strong and weak students (Dewald & McCann, 1999).

Competency-based education requires changes in the education process, outcomes and roles of educators and students. For example, more active and realistic learning activities such as small group exercises, case presentations, case studies, and problem-based exercises could be used in the classroom. Such activities make students an active part in the learning process rather than just passive recipient of information from the

instructor. Teachers become real instructors and facilitators of learning; their role is to guide students and provide them with feedback on their performances.

Education based on competencies calls for faculty agreement on what constitutes competency for entry-level professionals and subsequently to ensure that students attain these competencies prior to graduation. Students and teachers must know exactly what is expected from them. Product and performance assessments are required to assess competencies and instructors must be trained in such evaluation methods (Questions about competencies, 1994). This means that the program administrator must ensure the qualification of the faculty in using competency-based evaluation and teaching strategies. Training workshops could be offered to faculty who are unfamiliar with competency-based principles and methods. Faculty must review program competencies at the beginning of each course and indicate where (course number) and how (test, paper, case study, etc.) they will evaluate each competency. Course material and sequence must be designed around the competencies. Moreover, competencies that are related to particular courses could be identified in course syllabi.

In competency-based education, higher expectations and standards are identified as criteria for passing the program instead of just a passing grade in course after course as in discipline-based education. Competency-based education assures that graduates of the program will meet high professional standards of performance. Therefore, assessment strategies must be changed in competency-based education, for example, using process evaluations, self and peer assessments, and case-based tests, rather than formative and average daily grading assessments. Student's self and peer evaluations are necessary to

allow students to develop critical-thinking and assess their own competencies (O'Neill, 1994).

A disadvantage of competency-based education is that the specified competencies educators name as the requirements for entry-level practice tend to limit all other educational goals. Students and educators may work hard to master the predetermined competencies and lose enthusiasm for learning for its own sake (Marchese, 1994).

Discipline-based versus Competency-based Curricula

According to Tedesco (1994), dental educational programs have worked at developing discipline-based (content-based) curricula for nearly 70 years. Development of discipline-based curricula is a "bottom-up" process where specific courses are identified by tradition as being fundamental to enter a professional program. Courses are arranged vertically according to specified disciplines, completely independent of other specialty areas. Each course is sequenced based on the completion of prerequisites of proceeding courses, according to educators' traditional assumptions of what must be taught. Teaching and assessment methods and contents used in discipline-based curricula are usually familiar to educators. The end product of each discipline is the successfully completion of all requirements and courses pertaining to that discipline (Chambers, 1993; Tedesco, 1994). The discipline-based approach to curriculum development ensures that discipline content is covered. However, it fails to direct the faculty on the final outcome of the overall program, which is the competent, entry-level practitioner (Hendricson & Kleffner, 1998).

In contrast, competency-based curriculum development is a "top-down" method started with clearly stated competencies identified by the faculty. It is the type of

curriculum that focuses on what students need to learn to be competent professionals rather than what educators want students to learn based on their area of interest. Once the competencies are determined, faculty work backward to build a sequence of performance-based learning experiences, which incorporate subject material from a variety of specialty areas, and evaluations that assist students to master the predefined program's competencies. Competencies guide educators and program directors in developing and managing the curriculum. Curriculum content is selected based on an analysis of the actual competencies performed by entry-level practitioners. Learning experiences are restricted to crucial subject material developed by the program educators (Conny, 1994;Hendricson & Kleffner, 1998). Because such a curriculum focuses on achievement of multidimensional competencies, requiring knowledge, skills, and values from different disciplines, multidisciplinary learning is essential.

Henderson and Kleffner (1998) mentioned that transitioning an existing educational program from a discipline-based to a competency-based curriculum requires a significant shift in method of teaching and thinking among the faculty and considerable changes in curriculum content and design, for example, identifying the evaluation methods that will be used to assess competencies, when (specific course) each evaluation will be used, and the grading system (pass/fail, grades, etc). Moreover, to be successful, careful planning and management by a specialized educational committee to supervise implementation and make modifications is required. Transition from a discipline-based to a competency-based curriculum represents one of the challenges facing the ADS educators at JUST because the program lacks experts in competency-based dental

hygiene education. However, given that the faculty is small, a change in philosophy and curricular design may be more easily implemented than in a large program.

Competency-based Evaluation Techniques

Competency-based education helps in improving the overall quality of the curriculum and in accessing strategies for achieving such improvement. The use of competencies in education and curriculum planning require competency assessment techniques suitable for each stage in the competency continuum. Chambers and Glassman (1997) have proposed competency assessment strategies for each learning level in dental education (See Table 3). These can be readily applied to dental hygiene education.

Table 3. Learning Issues, Educational Methods, and Evaluation Methods Appropriate at Various Stages of the Competency Continuum (Chambers & Glassman, 1997).

Stage of competency	Learning issues	Educational methods	Evaluation methods
Novice	Isolated facts, performance	Lecturing, lab; faculty control	Tests, self-and peer-evaluations, case-study
Beginner	Some synthesis, integration, few choices	Seminars, labs, supervised work	Simulations, self-and peer evaluation, process assessments, papers
Competent	Independence, choice, self control	Realistic work settings	Authentic/performance-based evaluations, practical exams, senior exit exam
Proficient	Identify, profess-ional norms, context	Socialization, specialized training	Work-related markets
Expert	Internalized, patient-centered focus	Self-managed	Self-assessment, internalized standards

Tests are helpful for assessing isolated facts and skills so they are appropriate for testing novice learners. In clinical instruction, tests involve observation of students'

foundational performances (skills) or outcomes under standardized, controlled conditions such as pre-clinical laboratory situations that require students to practice according to specified predetermined performance criteria (McNabb & Zarkowski, 1984). *Simulations* are suitable for evaluating beginners, who start to apply and integrate information and skills in a variety of patients' cases. Simulations include observation of performances or products in contexts that are near to real work settings. Examples of simulations are library papers, case-based tests, oral examinations, treating patients in the clinic under direct supervision, board exams, and problem-based learning practices (Chambers & Glassman, 1997).

Authentic evaluations, also known as *performance-based evaluations*, are a group of assessment techniques that involve observation of performance or products in situations similar to natural practice settings, where students' application of knowledge and skills within a professional environment is evaluated. Authentic evaluations are used to assess competencies that cannot be evaluated by the traditional assessments such as competencies dealing with patient management, professionalism, cross-discipline skills, and psychomotor skills that require understanding and application of basic, dental, and dental hygiene sciences. Test cases, ratings, case presentations, research projects, portfolios, and involvement in community activities are examples of authentic evaluations that can be used in educating oral healthcare professionals (Chambers & Glassman, 1997; Hendricson & Kleffner, 1998; Whipp, Ferguson, Wells, & Iacopino, 2000; Gadbury-Amyot, Holt, Overman, & Schmidt, 2000).

One characteristic of performance or authentic evaluations is that they rely on the instructor's judgment that is dichotomous-based, rather than on scores or averages. A

student, who had finished an educational program, may be able or unable to practice as an entry-level professional. Making a judgment about a student's competency in forms or categories such as mastery/non-mastery or satisfactory/needs improvement/ unsatisfactory is more accurate to distinguish between students who are competent from those who are not, than are grades of A, B, or C, which do not provide such meaningful distinction. Table 4 lists four types of authentic evaluations that could be used effectively in dental and allied dental education.

Table 4: Types of Authentic Evaluations that are Useful in Dental and Allied dental Education (Chambers & Glassman, 1997; Gadbury-Amyot, Holt, Overman, & Schmidt, 2000).

Authentic evaluation	Definition	Examples
Ratings	Summary judgments by qualified raters who observe and make decisions about students in comparison to standards/ guidelines given in the rating task	Faculty-, patient-, and self-ratings
Exemplary products	Ideal or excellent examples or records of student's work that an individual, who were not present at the time it was accomplished, can use as evidence of a student's ability	Documented cases-with charts, photographs, and patient report Summaries of work completed, research abstracts, letters of appreciation for participation in community programs
Test cases	Independent, unaided performances of tasks that are similar to future professional roles under partially-controlled conditions.	Evaluate process of care delivery (by observation), understanding of procedure (by questioning), the integration of multiple processes into comprehensive care (by case presentation), personal practice management skills (by case selection and preparation review)
Portfolio evaluation	Purposeful collection of student work that document evidence of student learning, progress, and professional and competency attainments over time	Examples of portfolio evaluation are displayed in Appendices B and C

Implications of CBE for Dental and Allied Dental Education

Dental hygienists are licensed oral healthcare professionals who provide clinical, educational, preventive, research, administrative, and therapeutic services that support total health by promoting optimal oral health (ADHA, 2001). Dental hygienists can work in many settings such as private dental offices, hospitals, managed care organizations, healthcare clinics, nursing homes, long-term facilities, and schools. Baccalaureate-level dental hygienists are prepared to assume six major employment roles as clinicians, researchers, administrators/ managers, health promoters/educators, consumer advocates, and change agents (ADHA, 2000; ADHA Dental Hygiene Fact Sheet; Darby & Walsh, 1995).

As part of the healthcare team, dental hygienists play an integral role in helping patients achieve and maintain optimal oral health, which is part of general health. Therefore, dental hygiene educational programs have the responsibility to graduate competent entry-level dental hygienists who are able to practice competently in different settings and for a variety of populations. To do so, dental hygiene educational programs must move from traditional discipline-based education, where students learn a large amount of information and isolated skills, to competency-based education that integrates knowledge, skills, and values essential to perform a particular competency.

In 1993, the AADS proposed a new strategy for curriculum planning based on competencies (Dewald & McCann, 1999; Devore, 1994). In 1998, the Commission on Dental Accreditation revised the accreditation standards that obliged dental hygiene educational programs to define and list the competencies needed for graduation and to utilize evaluation methods that measure all identified competencies (American Dental

Association, 1998; Dewald & McCann, 1999). In the same year, the AADS, Section on Dental Hygiene Education Competency Development Committee, proposed competencies for entry into the profession of dental hygiene (See Appendix D) (AADS, Section on Dental Hygiene Education Competency Development Committee 1999). This document was to guide dental hygiene educational programs in defining their graduates' competencies.

The AADS competency document identifies five domains, where entry-level dental hygiene practitioners must demonstrate competency: core competencies, health promotion/disease prevention, community involvement, professional growth and development, and patient/client care (See Appendix D). Each domain was further supported by a list of 5 major competency statements and 46 supporting competencies. Since its publication, dental hygiene programs in the US have used this document as a model for defining competency in their own curricula.

To move toward competency-based education, dental and dental hygiene programs have worked toward developing a competency-based curriculum. DeWald, and McCann (1999) described a three-step process to develop a competency-based curriculum and recommendations to improve the process for other programs. The process involved the development of a competency document, an evaluation plan, and a curriculum outline that defines the curriculum design and content in terms of competencies. The competency document, *Competencies for the Dental Hygienist*, developed at the Caruth School of Dental Hygiene, included 3 domains, 9 major competencies, and 54 supporting competencies (See Table 5). The document served as a basis for the next two steps in competency-based curriculum development.

Table 5. Organization of the competency document for Caruth School of Dental Hygiene (DeWald & McCann,1999)

Domains		
Professionalism	**Health Promotion & Disease Prevention**	**Patient Care**
Ethics 9 supporting competencies **Information Management & Critical Thinking** 6 supporting competencies **Professional Identity** 4 supporting competencies	**Self Care** 4 supporting competencies **Community** 5 supporting competencies	**Assessment** 13 supporting competencies **Planning** 3 supporting competencies **Implementation** 7 supporting competencies **Evaluation** 3 supporting competencies

The second step was to identify evaluation methods for the nine major competencies. The evaluation methods included those that were currently used in the program, such as multiple-choice examinations; case presentations; clinical performance examinations; table clinics; and mock board tests; as well as new assessment strategies that are performance-based. To identify evaluation method, course directors indicate precisely where (specific course) and how (test, paper, case analyses, etc) they assess the nine major competencies. In order to measure students competence in areas such as ethical reasoning, literature critiquing, radiographic interpretation, health promotion, disease prevention, strategy planning, patient assessment and communication that were inadequately evaluated through out the program, a Senior Exit Examination (SEE) was developed and applied at the Caruth School of Dental Hygiene in 1995. The SEE consisted of three parts: an objective, structured clinical examination, with oral and written sections. For each major competency, multiple evaluation methods were

identified. However, the evaluation plan was revised around the 45 supporting competencies instead of just the nine major competencies. This was one of the authors' recommendations for other dental hygiene programs to consider when developing a competency-based curriculum. In addition to student evaluations, program assessment methods were developed and implemented including annual assessment surveys for graduates, faculty, alumni, and patients. The results of these surveys were used to assess and improve the overall program. Table 6 shows a multidimensional evaluation plan used to evaluate a main competency on ethics. From the plan, one can see the supporting competencies, the courses where these supporting competencies are developed, the evaluation methods used to determine if supporting competencies are achieved, and the degree to which students are achieving the supporting competencies. When students are not reaching competencies, then a curriculum change is implemented.

The third step was to identify the course content for each supporting competency. The competency document was distributed to all dental hygiene course directors as well as all dental hygiene science faculty who were asked to indicate the course topics and content taught that supported the competencies. The result was a comprehensive curriculum document that is aligned with the program competencies. The supporting competencies that are related to specific course content and topics were listed in course syllabi to help students realize the relationship between the curriculum content and the competencies they were learning (This step answers the question: why we need to learn these topics?). According to Dewald and McCann (1999), the curriculum inventory provided a mechanism for reviewing course content and sequence.

Table 6. Revised Competency Evaluation Plan and Report for One Main Competency (Dewald & McCann, 1999).

Ethics. The hygienist must be able to discern and manage the ethical issues of dental hygiene practice in a rapidly changing environment.

Methods	Supporting Competency	When (course)	Monitor	Results (1996)	Resulting Action (1997)
Exams or Quizzes	1.1 Articualte ethical principles ... 1.2 Serve...without discrimination ... 1.3 Appreciate cultural differences ... 1.4 Provide humane care ... 1.5 Maintain honesty in relationships... 1.6 Ensure privacy ... 1.7 Comply with laws ... 1.8 Take action against incompetent colleague ...	301; 421; 472; 422 441; 464; 472; 462; 452; 441; 462; 301; 472; 318; 472; 318; 461; 318; 461; 421; 411; 481; 402; 322; 382; 318; 301	Course directors	Passing grades	No action needed based on exam results
Written Feedback	1.2; 1.4; 1.5; 1.6; 1.7	Pre-clinical and clinical conduct Evaluation	Course directors	Passing grades	No action needed
Community	1.2; 1.3	462	Course director	Passing grades	Reworded 1.3. Moved to patient care domain
Senior Exit Exam	1.1	434 clinical DH	Course director	87.5% passed on first attempt	Integrate DH1 students into D3 Ethics course. Reworded to: " apply ethical reasoning"
Surveys	1.1; 1.2; 1.3; 1.4; 1.5; 1.6; 1.7; 1.8	Annually	Director of assessment	>90% "prepared" except in 1.8	Reworded 1.8 to reflect entry-level skill "use peer assistance"

A curriculum inventory is defined as a document that outlines the entire curriculum in terms of the supporting competencies. For each supporting competency statement, two levels of course topics related to that competency were listed: a general, defined as three to four topics covered in traditional lecture, and then a more detailed level of subject material (foundation topics), defined as the products of didactic and laboratory instruction that include the prerequisite information and skills necessary for satisfactory mastery of supporting competencies. An example of a supporting competency for ethical reasoning with its major and foundation topics is provided in table 7. The curriculum inventory enables faculty to review the overall curriculum, course content, and how course topics support each competency. Moreover, the curriculum inventory serves as a valuable resource for deleting and adding courses, changing course material, developing new evaluation methods including classroom activities and assignments, and orienting new faculty to the curriculum.

Table 7. Curriculum Foundations for a Supporting Competency

Supporting Competency

1.1 The dental hygiene graduate must be able to apply ethical reasoning to dental hygiene and practice with personal and professional integrity.

Major Topics for Ethical Dilemmas

Informed Consent (301)
Whistle Blowing (301)
Managed Care (301)
Sexual Harassment (301)
HIV and AIDS (301)
Ethics and Patient Management with Pain Anxiety Control (421)
Abuse of Drugs by Office Personnel (421)
Ethics in Research Design (472)

Foundation Topics

Ethical Decision Making Model (301)
Eight Obligations of Dental Professionals (301)
Central Values for Dental Professionals (301)
Ethical Theory (301)
Prima Facie Duties (301)
Four Models of Professional/Patient Relationships (301)
ADHA Code of Ethics (301)

RECOMMENDATIONS

From the review of the literature on CBE and CB curriculum development, the following recommendations are made to revise and improve the current dental hygiene curriculum of the ADS program:

1. Change the ADS program from the traditional discipline, content-based education to competency-based education.

   Rationale: In order to meet the Jordanian public's expectations for competent, entry-level professionals who are able to provide safe, high quality, allied dental services, the ADS director and faculty need to revise the current ADS curriculum to by applying the principles of competency-based education to both course and curriculum development, and evaluation.

2. Use the three-step CB curriculum development process established by Dewald and McCann, (1999) as a model to develop a Dental Hygiene Competency-Based curriculum for the ADS program at the JUST. The following steps are recommended to develop a CB curriculum for the ADS program:

   2.1 Develop a competency document for the ADS program that outline the competencies for the entry-level DHs and DAs in Jordan. The competencies will represent the ADS educational goals and serve as a "blueprint" for CB curricular development and improvement.

   As a first step in the ADS CB curriculum development, a suggested DH competency document for the ADS program is presented in Appendix E. This document draws heavily from the competency documents of the educational programs at the Caruth School of Dental Hygiene at The Texas A & M

University; the Gene W. Hirschfeld School of Dental Hygiene at Old Dominion University; and the AADS document, "*Competencies for the Entry-level Dental Hygienists*" (See Appendix D).

Rationale: The competencies suggested in the proposed dental hygiene competency document reflect the ADS program goals and the competencies for the entry-level dental hygienist in Jordan. The competency document includes 3 domains, 10 major competencies, and 39 supporting competencies. The document will be presented to the ADS program director and faculty for approval and then used by the faculty to continue the next three steps of ADS competency-based curriculum development. However, because graduates of the ADS must also be competent dental assistants, another document that outlines the competencies for entry-level dental assistants needs to be developed.

2.2 Develop competency-based evaluation methods that assess students' competencies such as performance-based practical evaluations, authentic evaluations, comprehensive senior exit examination, self and peer evaluation, surveys, case-study papers/tests, test cases, oral examinations, problem-based evaluations, case presentations, research projects, etc.

2.3 Identify learning activities/ strategies that help students attain the program competencies such as small group activities, case-studies papers, article critiques, table clinics, seminars, community practicum, pre-clinical laboratory practice, case scenarios, etc.

2.4 Arrange learning activities along the program in a sequence that help students to progress along the competency continuum. For example, use pre-clinical

laboratory practice in the first semester of the third year, when students are novice learners, to allow them to acquire the foundational skills and knowledge necessary for subsequent mastery of the program competencies. Then, in the second semester of the same year, when students are beginner learners, have them start treating patients in the clinic, under faculty supervision, where they begin to apply the foundational abilities learned in pre-clinical conditions to a variety of patient cases. As fourth year students progress toward competency level, they must experience and practice under a wide variety of real work settings and provide dental hygiene services for different types of patients including children, adults, elderly, medically compromised, etc. Problem-based learning activities, such as ethical dilemmas, comprehensive case presentations and analysis, must also be used at this level where students are required to integrate information, skills, and values from different disciplines.

2.5 Develop a curriculum inventory/document by aligning and defining the curriculum content (course content and sequencing, learning and evaluation strategies) in terms of competencies.

2.6 The last four steps of curriculum development need to be continued by the dental hygiene course directors and all other faculty members who teach the ADS students. For this purpose, the following is recommended:

A. A curriculum development committee must be established. The responsibilities of this committee will include:

1) Introducing the ADS faculty and course directors to the competency-based education principles, including the characteristics and

components of competency-based education, the characteristics of learners at each stage of the competency continuum, and the teaching and evaluation methods appropriate for each stage.

2) Course directors as well as all faculty members teaching ADS students will participate in finalizing the ADS competency document, and identifying evaluation and teaching methods appropriate to educate and evaluate the program competencies. Therefore, the committee will ask the ADS educators to answer three main questions: what competencies do you teach, what topics do you teach in support of those competencies, and what methods do you use to evaluate the competencies? (See Figure 3).

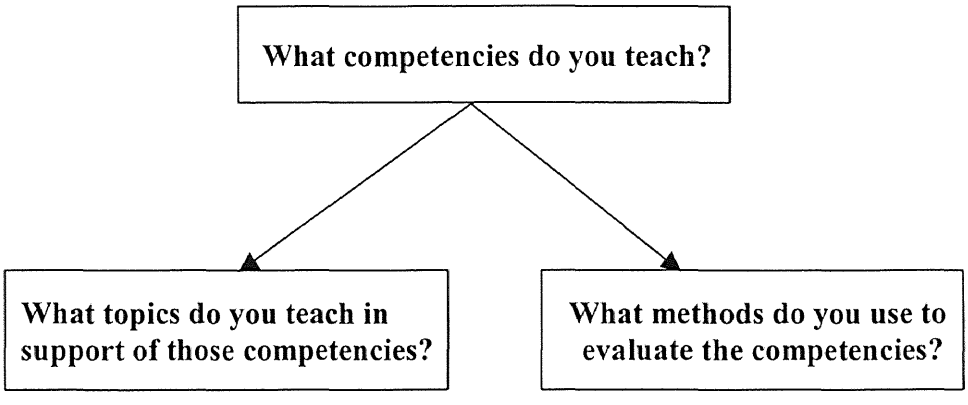

Figure 3: Questions to be directed to the ADS Educators to Identify When (Course Number) and How (Tests, Papers, Small Group Activity, etc.) the Program Competencies will be Presented and Evaluated.

3) The committee will review and use the answers to the above questions to develop a comprehensive evaluation plan and curriculum document, with content linked to the supporting competencies.

4) The committee will then review and revise the current ADS curriculum including course content, sequencing, course outlines, and performing modifications that are consistent with the competency-based curriculum development.

5) Once the competency-based evaluation and teaching methods are determined, the committee will align the curriculum content and sequence with the competencies.

B. Define the foundational knowledge, skills, and attitudes related to each supporting competency and indicate the courses where these foundational abilities will be covered.

Rationale: For each supporting competency, there is foundational knowledge, skills, and attitudes that students must learn to perform that competency. These foundational abilities represent the courses' objectives and must be listed along with the supporting competencies in courses syllabi so that students will identify the relationship between what they learn and the competencies they will develop. This will help to answer students' age-old question: "*why do we have to take all these science courses?*"

C. The existing evaluation methods as well as new student assessment strategies that are competency-based should be incorporated in the evaluation plan (See Tables 3, 4, and 6, and Appendix F).

1) Increased emphasis should be placed on identifying performance-based assessments for the clinical competency-based courses.

2) Development of a comprehensive DH exit examination to assess students' competencies at the end of the program. This examination will consist of three parts: clinical, oral and written parts. The results of this test will be used to assess the ADS program effectiveness and as a basis for planned change.

3) Develop the evaluation plan around the supporting competencies rather than just the major competencies to document how each competency in the program will be assessed. Table 5 represents the revised evaluation plan of the Caruth School of Dental Hygiene where evaluation methods for each supporting competency were identified. Appendix F also displays the ODU dental hygiene curriculum management and evaluation plan. These evaluation plans serve as examples or models that the ADS faculty could used to create the ADS program CB evaluation document.

3. Establish accreditation standards for the Jordanian dental hygiene program to ensure competent graduates who are able to practice safely and ethically in real work settings. These standards could be modeled after the standards used in the US and Canada (http://www.ada.org/prof/ed/accred/stand/index.html).

4. Ensure student and faculty understanding of the competency statements.

   4.1 The competency document should be introduced to the students enroll in the ADS program during the orientation process so that they will know what they will achieve in their dental hygiene and dental assisting education.

4.2 Course directors should review the overall curriculum competencies, and identify the competencies they will teach and evaluate in their courses.

4.3 Competencies should be stated in language that is clear to all students and faculty. This information should be in every course syllabus and reviewed at the beginning of each course.

5. The ADS Program effectiveness should be assessed annually.

5.1 Annual program assessment surveys should be developed and administered to students, faculty and patients where they will be asked to rate graduates' competencies. Results will be analyzed and used efficiently for program improvement and curriculum modification (See Appendix G: ODU Curriculum Management Plan).

6. Change the current ADS program's clinical evaluation system, which is requirement and daily grading-based, to be summative and performance-based.

Rationale: The current evaluation process used in the ADS to assess students' clinical practice and competence is based on completion of requirements and average daily grading. Research studies showed that this evaluation approach is ineffective for assessing students' competencies (DeWald & McCann, 1999; McNabb & Zarkowski, 1984). Completion of specified number of requirements does not ensure that the student is competent. Moreover, students differ in their pace of learning and progress. Some students acquire competencies with fewer procedures' repetitions while others need more time and practice. Learning activities should be sequenced to allow students to move from one level of the competency continuum to another, and progress at their own pace.

Daily clinical grades also do not differentiate between weak and strong students. This is because daily assessments in the clinic are more formative in nature, and reflect teaching and faculty intervention. Summative/comprehensive evaluations in the clinic, such as practical/performance-based examinations, test cases, instrument evaluations, and mock board tests, are more able to differentiate between competent and incompetent students. Such evaluations are usually based on instructor judgment about student's performance, such as a rating or a grade, rather than just observing the student, so that a student's competence can be measured and monitored over time.

7. Relate the students' performance results to the program outcomes assessment.

   Rationale: A formalized process must be in place to ensure that competency evaluation results are routinely analyzed and used by faculty for program improvement. Students' assessment results must be reviewed and analyzed systematically by all faculty or a representative committee and recommendations about the curriculum must be made based on assessment data. Assessments that reflect weaknesses in student performance are indicators that curricular modification is needed.

8. Active, realistic learning strategies must be developed and used in the classroom, e.g., small group learning exercises, paper projects, case presentation, patient cases for assessment and teaching, etc.

   Rationale: Such problem-based teaching methods help students to develop critical thinking, decision making, and problem solving skills that they need to begin independent practice in real work settings. Using these learning experiences make students an active part in the teaching-learning process rather than passive recipient of

lecture-type information that instructors traditionally deliver. Such learning strategies also allow students to integrate the foundational knowledge and skills they learn in the early general, dental, and dental hygiene classes and in the pre-clinical laboratory practice.

9. Use reinforcement and detailed feedback as well as self and peer-evaluations as clinical learning and evaluation strategies.

   Rationale: Such teaching and evaluation techniques facilitate student's learning and allow students to evaluate their own performance and identify their own weaknesses, particularly in the novice and beginner stages of the competency continuum. Student characteristics at these learning levels include dependence on teachers and external rewards, and defensiveness, so reinforcement and feedback are effective clinical evaluative and teaching strategies at these phases.

10. Establish a pre-clinical laboratory DH course that help students learn the foundational skills. Students could work and practice on each other and on models since no laboratory setting or head-forms are available for the ADS program.

    Rationale: The current ADS curriculum has no pre-clinical dental hygiene course. Pre-clinical laboratory instruction, where students practice on manikins, models and on partners under ideal conditions and specific guidelines, is essential to help students develop the foundational psychomotor skills they need before practicing on patients in real work settings. Pre-clinical laboratory training is an effective learning experience that assists students to progress from the novice and beginner learning stages toward the competent phase. A pre-clinical course needs to be added to the

dental hygiene curriculum, in the first semester of the third year of the program, at the beginner and novice stages, to move student to the competent level.

SUMMARY AND CONCLUSION

This document reflects a proposed dental hygiene competency-based curriculum development plan for the ADS program at JUST. It also provides the ADS director and faculty with the best principles and practices in competency-based education that can be implemented to improve the current dental hygiene curriculum and to graduate competent dental hygienists. The overall plan outlines the steps that can be used to establish a competency-based curriculum for the ADS program at JUST. The steps involve the definition of the competencies that the ADS program wants the students to possess once they graduate, the development of an evaluation plan to assess the students competencies and the program effectiveness, the identification and arrangement of learning experiences that help students attain the competencies, and the definition of the curriculum in terms of the competencies. Moreover, the plan includes a proposed dental hygiene competency document for the ADS program, modified from the competency documents of the dental hygiene programs at the Old Dominion University and the Texas A and M University and the AADS document, "*Competencies for the Entry-level Dental Hygienist*". Pre-clinical theoretical and practical dental hygiene course outlines and descriptions are also developed as models based on the reviewed best principles and practices of competency-based education: *Introduction to Dental Hygiene (DH 101) and Pre-clinical Dental Hygiene (DH 102).*

Competency-based education is defined as the type of education that based on a clear definition of the entry-level competencies that graduates must attain to begin independent practice in real life settings. Competency-based education supposed that learning to become competent is a succession through five different stages (novice,

beginner, competent, proficient, and expert) that together form the competency continuum. Learning experiences are arranged to progress students through the stages of the competency continuum. Different instructional and evaluation strategies are used as appropriate at each level of learning and professional growth, and the entire sequence is coordinated to bring into being a competent beginning practitioner.

Competency-based curriculum organization is a top-down process that begins with the identified competencies and moves backward to establish learning experiences, course contents and sequence aligned around the identified competencies. Implications of competency-based education for dental and dental hygiene curricula include: interdisciplinary planning and implementation, a small number of courses that integrate foundational abilities from several disciplines, student learning guided by educational modules linked to specific competencies, learning activities based on case scenarios describing oral health problems, extensive exposure to patients from the first to the last week of the program, less reliance on lectures to communicate information and more reliance on small group and problem-based learning, faculty working as facilitators, mentors, and instructors rather than checkers, students' role change from passive consumers recipients of information to active problem-solvers and self-assessors. Competency-based education provides opportunities for differential student progress through the curriculum based on ability and motivation. Competency-based education placed minimal emphasis on educational progress determined by time and numbers (requirement-based evaluation), but rather emphasized student's ability to satisfactory perform a particular competency. Competency-based education necessitates the need for

performance-based testing with high situational reliability to the roles, responsibilities, and working conditions of practicing professionals.

In Jordan, the ADS program at JUST offered the bachelor's of science degree in dental hygiene and dental assisting since 1996. A dentist regulates the program and faculty from other educational programs such as dentistry, medicine, and public health, rather than dental hygienists, educate the dental hygienists. No accreditation standards, specified criteria, requirements, or competencies exist for the ADS program. What the dental hygiene students learn is based on what the instructors want the students to learn based on their area of expertise rather on what student need to learn to become competent entry-level practitioners. The program is based on discipline-based curriculum content and daily grades, requirement-based clinical evaluation system. No process-based evaluation methods or any other comprehensive theoretical or clinical examinations are used to assess students' competencies at the end of the program. Moreover, no licensure examinations or continuing education requirements exist for the dental hygienists in Jordan.

Based on the literature review, the following recommendations for improving and developing a competency-based ADS curriculum at JUST are proposed:

- Change the ADS program from the traditional discipline, content-based education to competency-based education.
- Use the three-step CB curriculum development process established by Dewald and McCann (1999) as a model to develop a dental hygiene competency-based curriculum for the ADS program at the JUST.

- Establish a curriculum development committee to introduce the ADS faculty and course directors to the competency-based education principles, ask the ADS educators to answer 3 main questions: what competencies do you teach, what topics do you teach in support of those competencies, and what methods do you use to evaluate the competencies?, review and use the answers to the above questions to develop a comprehensive evaluation plan and curriculum document, with content linked to the supporting competencies, revise the current ADS curriculum, including course content, sequencing, course outlines, and perform modifications that are consistent with the competency-based curriculum development, and align the curriculum content and sequence with the competencies.
- Incorporate the existing evaluation methods as well as new student assessment strategies that are competency-based in the evaluation plan.
- Establish accreditation standards for the ADS educational program to ensure high quality competent graduates who are able to practice safely and ethically in real work settings.
- Ensure students and faculty understanding of the competency statements.
- Assess the ADS Program effectiveness annually.
- Change the current ADS program's clinical evaluation system, which is requirement and daily grading-based, to be summative and performance-based.
- Relate the students' performance results to the program outcomes assessment.

- Develop and use active, realistic learning strategies in the classroom, e.g., small group learning exercises, paper projects, case presentation, patient cases for assessment and teaching, etc.
- Use reinforcement and detailed feedback as well as self and peer-evaluations as clinical learning and evaluation strategies.
- Establish a pre-clinical laboratory Dental Hygiene courses that help students learn the foundational skills. Students could work and practice on each other and on models since no laboratory setting or head-forms are available for the ADS program.

This paper is of particular value for the ADS program to move from discipline-based to competency-based education to graduate competent entry-level dental hygienists, able to provide safe and effective therapeutic and preventive services to Jordanian citizens. It is the responsibility of educational programs to graduate competent professionals and competency-based education is one, strongly, by which competence is achieved.

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Appendix A

Faculty of Applied Medical Sciences
Department of Allied Dental Sciences
Allied Dental Science Program

The Faculty of Applied Medical Science in Jordan University of Science and Technology offers a bachelor degree in Allied Dental Science, after completion of (129) credit hours successfully provided in the following:

First. According to the instructions no (1) dated 1987 (Instructions for offering the bachelor degree in Jordan University of Science and Technology which issued in Deans Council according to the regulation of offering the scientific degrees and Certificates in Jordan University of Science and Technology and its amendments).

Second Credit hours of Allied Dental Science for having the bachelor degree divided as follows:

Requirements	Obligatory Hours	Elective Hours	Total
University Requirements	16	9	25
Faculty Requirements	44	--	44
Department Requirements	60	--	60
Total	120	9	129

1. University Requirements:
According to the instructions above and its amendments (25) credit hours are divided as:

a) Obligatory Requirements: (16) credit hours divided as:

COURSE SYMBOL & NO	COURSE NAME	CREDIT HOURS	PRACTICAL HRS	THEORY HRS	PREREQUISITE
MS100	Military Science	3	--	3	--
A101	Arabic Language Ō	3	--	3	--
A103	Applied Studies in Arabic Language	1	3	--	A101 or Co-requisite
E111	English Language 1*	3	--	3	--
CS100	Introduction to Computer	3	--	3	--
E112	English Language 2	3	3	--	E111 or Co-requisite

E099. Preparatory English Language (3 credit hours). Students who get less than 50% in the English Language Level Exam must enroll in this course.

* Students who get 80% or more in the English Language Level Exam are exempted from enrolling in this course.

- This course is required for the Jordanian students and the results are on a pass or fail basis. Students who are exempted from this course include those who: graduated from the Royal Military College, graduated from the School of Candidates, and graduated from equivalent colleges. Arab students (not Jordanians) must take another substance course from the Elective courses.

- University Students who don't speak the Arabic language must enroll in these two courses in Arabic language:

COURSE SYMBOL	**Course Name**	**Credit hour**
A101 a	Arabic Language for the Nonnative Arabic Speakers	3
A103 a	Application Studies in Arabic language for the Nonnative Arabic Speakers	1

b) **Elective Courses:** (9) credit hours selected from the following:

COURSE SYMPOL & NO.	Course Name	Credit Hour
HS112	Haddeth Shareef	3
HS113	Al-Akedah	3
HS114	Al-Fikeh	3
HS115	Islam and Contemporary Issues	3
HS116	Islamic Economic System	3
HS121	Introduction to Sociology	3
HS122	Introduction to Anthropology	3
HS123	Introduction to Education	3
HS124	Jordan's Educational System	3
HS125	Introduction to Philosophy	3
HS126	Introduction to Psychology	3
HS131	Islamic Culture	3
HS161	Contemporary Problems	3
HS231	The History of Science for Islam	3
Ph103	Environment Protection (not for Medical & Nursing students)	3
Ph104	Society Health & Nutrition (not for Medical & Nursing students)	3
Phar104	Drugs & Medicinal Plants in Jordan (not for Medical & Pharmacy students)	3
HS141	Introduction to Economic	3
HS151	Introduction to Administration	3
Ph200	Principles of First Aid	3
PP200	Home Gardens (not for Agricultural students)	3
PP201	Bees Keeping (not for Agricultural students)	3
VM211	Animal Health (not for Veterinary Medical & Agricultural students)	3
ME121	Fundamentals of Automobile Engineering	3

2.Faculty Obligatory Requirements: (44) credit hours assigned for the following:

COURSE SYMPOL & NO	COURSE NAME	CREDIT HRS	PREREQUISITE
Math102a	Calculus	3	
Bio103	Biology	3	
Phy103	Physics	3	
Chem103	General Chemistry	3	
Chem107	Chemistry lab	1	Chm103 or Co-requisite
Bio107	Biology lab	1	Bio103 or Co-requisite
Chem217	Organic Chemistry	3	Chm103
CS116	Programming Languages	3	CS 100
M212	Pathology	3	M218 & M234
M218	Gross Anatomy & Histology	3	Bio107
M222	Biochemistry	3	Chm217
M227	Biochemistry Lab	1	M222 or Co-requisite
M234	Human Physiology	4	M218 or Co-requisite
M242	Microbiology	3	Bio107
M243	Microbiology Lab	1	M242 or Co-requisite
M302	Medical Ethics	1	
Ph311	Biostatistics	2	
PT485	Managements in Allied Medical Sciences	3	
Total		**44**	

PT458 Management in Allied Medical Sciences is an obligatory Faculty Requirement in English Language (Professional English)

3. Department Requirements: (60) credit hours from the following

COURSE SYMBOL&NO	COURSE NAME	Credit hour	PREREQUISITE
ADS 101	Introduction to Dental Science & Dental Terminology	1	
ADS211	Dental Morphology & Occlusion	2	ADS101
ADS212	Dental Materials	3	ADS101
ADS321	Restorative Dentistry	2	ADS212
ADS322	Removable Prosthodontics	2	ADS212
ADS323	Anesthesia & Oral Surgery	2	M218, M219
ADS324	Peadodontics & Orthodontics	2	
ADS331	Periodotics 1	2	M218
ADS332	Oral Pathology & Oral Medicine	2	M212, M242
ADS341	Cariology	1	
ADS325	Radiology 1	2	
ADS311	Clinical Allied Dental Sciences1	3	ADS321, ADS331
ADS326	Radiology 2	3	ADS325
ADS333	Periodotics 2	3	ADS331
ADS403	Medical Conditions	1	
ADS412	Clinical Allied Dental Sciences 2	3	ADS312
ADS434	Clinical Oral Hygiene 1	6	ADS333
ADS443	Oral Epidemiology for Allied Dental Science Students		
ADS444	Dental Hygiene & Oral Epidemiology	2	
ADS445	Preventive Dentistry	2	PT311
ADS413	Clinical Allied Dental Sciences 3	3	ADS412
ADS435	Clinical Oral Hygiene 2	5	ADS434
GH 351	Nutrition	3	Bio103, Chm103 or Co-requisite
M219	Head & Neck Anatomy	3	M218
ADS366	Pharmacology for Allied Dental Sciences Students	1	M234
ADS491	Methodology & Research Project	1	
Total		**60**	

Faculty of Applied Medical Sciences
Department of Allied Dental Science
Allied Dental Science Program

Suggested Plan for Allied Dental Science Program

First Year/First semester:

COURSE SYMBOL & NO	COURSE NAME	CREDIT HOURS	PRACTICAL HOURS	THEORY HOURS	PREREQUISITE
ADS101	Introduction to Dental Science & Dental Terminology	1	--	1	
A101	Arabic Language	3	--	3	
A103	Applied Studies in Arabic Language	1	1	--	
Bio103	Biology	3	--	3	
Bio107	Biology Lab	1	1	--	Bio103 or Co-requisite
Chem103	General Chemistry	3	--	3	
Chem107	Chemistry Lab	1	1	--	Chm 103 or Co-requisite
*E111	English language 1	3	--	3	
Total		**16**	**3**	**13**	

* Student who earned an 80% or more must enroll in E112; student who earn < 80% must enroll in E099.

First Year/Second Semester:

COURSE SYMBOL & NO	COURSE NAME	CREDIT HOURS	PRACTICAL HOURS	THEORY HOURS	PREREQUISITE
Phy103	Physics	3	--	3	
MS100	Military Science	3	--	3	
CS100	Introduction to Computer	3	1	2	
Chem217	Organic Chemistry	3	--	3	Chm103
*E112	English Language 2	3	--	3	
Math102a	Calculus	3	--	3	
Total		**18**	**1**	**17**	

* Student who earned an 80% or more must enroll in an Elective course; student who earn < 80% must enroll in E111.

Second year/First semester:

COURSE SYMBOL & NO	COURSE NAME	CREDIT HOURS	PRACTICAL HOURS	THEORY HOURS	PREREQUISITE
M234	Human Physiology	4	1	3	M218 or Co-requisite
GH351	Nutrition	3	--	3	Bio103, Chm103 or Co-requisite
ADS211	Dental Morphology & Occlusion	2	1	1	ADS101
ADS212	Dental Materials	3	1	2	ADS101
M218	Gross Anatomy & Histology	3	1	2	Bio103, Bio107
M242	Microbiology	3	--	3	Bio103, Bio107
M243	Microbiology Lab	1	1	--	M242 or Co-requisite
Total		**19**	**5**	**14**	

Second year/Second semester:

COURSE SYMBOL & NO	COURSE NAME	CREDIT HOURS	PRACTICAL HOURS	THEORY HOURS	PREREQUISITE
M219	Head & Neck Anatomy	3	1	2	M218
Ph311	Biostatistics	2	--	2	
CS116	Programming Languages	3	1	2	CS100
M212	Pathology	3	--	3	M218, M234
M222	Biochemistry	3	--	3	Chm217
M227	Biochemistry Lab	1	1	--	M222 or Co-requisite
	*Elective University Requirement	3	--	3	
Total		**18**	**3**	**15**	

* Student who earned < 80% on the English level exam must enroll in E112.

Third year/First semester:

COURSE SYMBOL & NO	COURSE NAME	CREDIT HOURS	PRACTICAL HOURS	THEORY HOURS	PREREQUISITE
ADS321	Restorative Dentistry	2	1	1	ADS212
ADS322	Removable Prosthodontics	2	1	1	ADS212
ADS323	Anesthesia & Oral Surgery	2	1	1	M218, M219
ADS324	Peadodontics & Orthodontics	2	1	1	
ADS325	Radiology 1	2	1	1	
ADS331	Period tics 1	2	1	1	M218
ADS332	Oral Pathology & Oral Medicine	2	1	1	M212, M242
ADS341	Cariology	1	--	1	
	*Elective University Req.	3		3	
Total		**18**	**7**	**11**	

* Students who earned < 80% on the English level exam must enroll in an Elective University Req.

Third year/ second semester:

COURSE SYMBOL & NO	COURSE NAME	CREDIT HOURS	PRACTICAL HOURS	THEORY HOURS	PREREQUISITE
M302	Medical Ethics	1	--	1	
ADS366	Pharmacology for Allied Dental Sciences Students	1	--	1	M234
ADS311	Clinical Allied Dental Sciences 1	3	3	--	ADS321, ADS331
ADS326	Radiology 2	3	2	1	ADS325
ADS332	Oral Pathology & Oral Medicine	3	2	1	ADS331
	*Elective University Req.	3		3	
Total		**14**	**7**	**7**	

* Student who earned < 80% on the English level exam must enroll in an Elective University Req.

Fourth year/ First semester:

COURSE SYMBOL & NO	COURSE NAME	CREDIT HOURS	PRACTICAL HOURS	THEORY HOURS	PREREQUISITE
ADS403	Medical Conditions	1	--	1	
ADS412	Clinical Allied Dental Sciences 2	3	3	--	ADS311
ADS434	Clinical Oral Hygiene 1	6	5	1	ADS333
ADS444	Dental Hygiene & Oral Epidemiology	2	1	1	
ADS445	Preventive Dentistry	2	1	1	PT311
	*Elective University Req.	--		--	
Total		**14**	**10**	**4**	

* Student who earned < 80% on the English level exam must enroll in an Elective University Req.

Fourth year/second semester:

COURSE SYMBOL & NO	COURSE NAME	CREDIT HOURS	PRACTICAL HOURS	THEORY HOURS	PREREQUISITE
PT458	Managements In Allied Medical sciences	3	--	3	
ADS413	Clinical Allied Dental Sciences 3	3	3	--	ADS412
ADS435	Clinical Oral Hygiene 2	5	5	--	ADS434
ADS491	Methodology & Research Project	1		1	
Total		**12**	**8**	**4**	

Appendix B

Example of a Portfolio Evaluation System for Graduation from Dental School

Competencies

Students would be instructed to see the school's competency list, which might be sorted by type (technical, diagnostic, patient management, etc.)

Evidence

1. Each technical competency must be signed off by the department chair based on … (details developed appropriate to the program).
2. Diagnostic competencies can be met by successfully presenting two cases in the case presentation course – one being the student's patient and the other being a standard case in a simulation testing format.
3. Patient management competencies must be signed off by the Group Practice Administrator.
4. Community service competencies are met through (a specified number of hours or experiences) of community rotations in health care settings.
5. Students must have completed the computer literacy program and the project on dental information management.
6. The problem-solving and scientific reasoning competencies can be met by means of
   a. Satisfactory completion of the new product evaluation exercise
   b. Completion of a research project approved by the Director of Student Research
   c. Attendance at three scientific meetings.

Standard

1. All competencies must be met to be eligible for graduation.
2. In cases of dispute, the student may be asked to meet with the Academic Standards Committee to present or interpret evidence.

Logistics

1. Students may submit evidence of completed competencies to the Office of Academic Affairs, using the appropriate forms, at any time.
2. At the beginning of each quarter in the final year, the Academic standards Committee will review all evidence and inform students of competencies yet to be met.
3. One moth prior to graduation, the Academic Standards Committee will meet to identify the status of each student:
   a. Students who have met all competencies will be certified for graduation.
   b. Students who have no reasonable chance of meeting standards within the month will be notified that their educational program will be extended.

   c. Students for whom there is doubt may be asked to meet with the advisory committee to present evidence or clarify evidence. The advisory committee will then recommend a course of action to the Academic Standards Committee.
4. Appeals of this process will be directed to the Academic Appeals Committee.

Reference:

Chambers, D. W., & Glassman, P. (1997). A primer on competency-based evaluation. *Journal of Dental Education, 61(8)*, 651-666.

Appendix C

Example of a Portfolio Evaluation System from a Dental Hygiene School

UMK DIVISION OF DENTAL HYGIENE PORTFOLIO DESIGN

PROGRAM COMPETENCY	EVIDENCE OF ATTAINMENT	YOUR PORTFOLIO ENTERIES
1.0: Our graduates must be competent in assessing persons of all ages/stages of life in order to design, implement, & evaluate dental hygiene care	Systems review (evidence-based) paper* Assessment competencies in clinic at or above clinically acceptable* -Systems review presentation -case presentation -case-based assessment -data collection using recognized indices; PI, BI, DMFT	
2.0: Our graduates must be competent in DH treatment planning and case presentation for persons of all ages/stages of life	1st semester-last semester treatment plan comparison and analysis of professional growth* Case study* -treatment planning exercise -treatment plan competencies in clinic at or above clinically acceptable -development and presentation of treatment plans for case presentations	

* essential evidence for inclusion in portfolio
**2 of 9 UMKC Division of Dental Hygiene Competencies

Source:

Gadbury-Amyot, C.C., Holt, L.P., Overman, P.R., & Schmidt, C.R. (2000). Implementation of portfolio assessment in a competency-based dental hygiene program. *Jounal of Dental Education, 64(5),* 375-380.

Appendix D

Competencies for Entry into the Profession of Dental Hygiene

Foreword

The American Association of Dental Schools (AADS), Section on Dental Hygiene Education Competency Development Committee, drafted the competency statements presented in this document. This committee had representation from both baccalaureate and associate degree dental hygiene programs. It also included representation from dental hygiene, clinical, social and basic sciences, and the American Dental Hygienists' Association. A separate committee, the Dental Hygiene Education Competency Draft Review Committee, further reviewed and provided feedback on the document once developed. Following these reviews, the competency statements were presented for public comment at the 1998 AADS Annual Session, the 1998 Dental Hygiene Directors' Conference and the AADS Section on Dental Hygiene Education homepage on the World Wide Web.

The competency statements have been presented in five domains. These domains were defined during a consensus exercise that was conducted at the 1997 Annual Session of the AADS, Section on Dental Hygiene Education program session. Individuals representing various facets of dental hygiene and dental hygiene education participated in this exercise.

Introduction

This document describes the abilities expected of a dental hygienist entering the profession. These competency statements are meant to serve as guidelines. It is important for individual programs to further define the competencies they want their graduates to possess, describing (1) the desired combination of knowledge, psychomotor skills, communication skills, and attitudes, and (2) the standards used to measure the hygienist's independent performance. The following should help to assess the competence of dental hygiene students and to improve the dental hygiene curriculum. Given the dynamic nature of science and the health professions, these suggestions should be reviewed and updated periodically.

As a participating member of the health-care team, the dental hygienist plays an integral role in assisting patients to achieve and maintain optimal oral health. Dental hygienists provide educational, clinical, and consultative services to individuals and populations of all ages, including the medically compromised, mentally or physically challenged, and socially or culturally disadvantaged.

As defined in this document, dental hygienists must exhibit competence in the following five domains:

(1) The dental hygienist must possess, first, the *Core Competencies* **(C)**, the ethics, values, skills, and knowledge integral to all aspects of the profession. These core competencies are foundational to all of the roles the dental hygienist.

(2) Second, in as much as *Health Promotion* **(HP)**/*Disease Prevention* is a key component of health care, changes within the health-care environment require the dental hygienist to have a general knowledge of wellness, health determinants, and characteristics of various patient/client communities. The hygienist needs to emphasize both prevention of disease and effective health-care delivery.

(3) Third is the dental hygienist's complex role in the *Community* **(CM)**. Dental hygienists must appreciate their role as health professionals at the local, state, and national levels. This role requires the graduate dental hygienist to assess, plan, and implement programs and activities to benefit the general population. In this role, the dental hygienist must be prepared to influence others to facilitate access to care and services.

(4) Fourth is *Patient/Client Care* **(PC)**, requiring competencies described here in ADPIE format. Because the dental hygienist's role in patient/client care is ever changing, yet central to the maintenance of health, dental hygiene graduates must use their skills to assess, diagnose, plan, implement and evaluate treatment.

(5) Fifth, like other health professionals, dental hygienists must be aware of a variety of opportunities for *Professional Growth and Development* **(PGD)**. Some opportunities may increase clients' access to dental hygiene; others may offer ways to influence the profession and the changing health-care environment. A dental hygienist must possess transferable skills, e.g., in communication, problem-solving, and critical thinking, to take advantage of these opportunities.

Core Competencies (C)

C.1 Apply a professional code of ethics in all endeavors.

C.2 Adhere to state and federal laws, recommendations and regulations in the provision of dental hygiene care.

C.3 Provide dental hygiene care to promote patient/client health and wellness using critical thinking and problem solving in the provision of evidenced-based practice.

C.4 Assume responsibility for dental hygiene actions and care based on accepted scientific theories and research as well as the accepted standard of care.

C.5 Continuously perform self-assessment for life-long learning and professional growth.

C.6 Advance the profession through service activities and affiliations with professional organizations.

C.7 Provide quality assurance mechanisms for health services.

C.8 Communicate effectively with individuals and groups from diverse populations both verbally and in writing.

C.9 Provide accurate, consistent and complete documentation for assessment, diagnosis, planning, implementation and evaluation of dental hygiene services.

C.10 Provide care to all clients using an individualized approach that is humane, empathetic, and caring.

Health Promotion and Disease Prevention (HP)

HP.1 Promote the values of oral and general health and wellness to the public and organizations within and outside the profession.

HP.2 Respect the goals, values, beliefs and preferences of the patient/client while promoting optimal oral and general health.

HP.3 Refer patients/clients who may have a physiologic, psychological, and/or social problem for comprehensive patient/client evaluation.

HP.4 Identify individual and population risk factors and develop strategies that promote health related quality of life.

HP.5 Evaluate factors that can be used to promote patient/client adherence to disease prevention and/or health maintenance strategies.

HP.6 Evaluate and utilize methods to ensure the health and safety of the patient/client and the dental hygienist in the delivery of dental hygiene.

Community Involvement (CM)

CM.1 Assess the oral health needs of the community and the quality and availability of resources and services.

CM.2 Provide screening, referral, and educational services that allow clients to access the resources of the health care system.

CM.3 Provide community oral health services in a variety of settings.

CM.4 Facilitate client access to oral health services by influencing individuals and/or organizations for the provision of oral health care.

CM.5 Evaluate reimbursement mechanisms and their impact on the patient's/client's access to oral health care.

CM.6 Evaluate the outcomes of community based programs and plan for future activities.

Patient/Client Care (PC)

Assessment

PC.1 *Systematically collect, analyze and record data on the general, oral and psychosocial health status of a variety of patients/clients using methods consistent with medicolegal principles.*

This competency includes:

a. Select, obtain and interpret diagnostic information recognizing its advantages and limitations.

b. Recognize predisposing and etiologic risk factors that require intervention to prevent disease.

c. Obtain, review and update a complete medical, family, social and dental history.

d. Recognize health conditions and medications that impact overall patient/client care.

e. Identify patients/clients at risk for a medical emergency and manage the patient/client care in a manner that prevents an emergency.

f. Perform a comprehensive examination using clinical, radiographic, periodontal, dental charting, and other data collection procedures to assess the patient's/client's needs.

Diagnosis

PC.2 *Use critical decision making skills to reach conclusions about the patient's/client's dental hygiene needs based on all available assessment data.*

This competency includes:

a. Use assessment findings, etiologic factors and clinical data in determining a dental hygiene diagnosis.

b. Identify patient/client needs and significant findings that impact the delivery of dental hygiene services.

c. Obtain consultations as indicated.

Planning

PC.3 *Collaborate with the patient/client, and/or other health professionals, to formulate a comprehensive dental hygiene care plan that is patient/client-centered and based on current scientific evidence.*

This competency includes:

a. Prioritize the care plan based on the health status and the actual and potential problems of the individual to facilitate optimal oral health.

b. Establish a planned sequence of care (educational, clinical and evaluation) based on the dental hygiene diagnosis; identified oral conditions; potential problems; etiologic and risk factors; and available treatment modalities.

c. Establish a collaborative relationship with the patient/client in the planned care to include etiology, prognosis, and treatment alternatives.

d. Make referrals to other health care professionals.

e. Obtain the patient's/client's informed consent based on a thorough case presentation.

Implementation

PC.4 *Provide specialized treatment that includes preventive and therapeutic services designed to achieve and maintain oral health. Assist in achieving oral health goals formulated in collaboration with the patient/client.*

This competency includes:

a. Perform dental hygiene interventions to eliminate and/or control local etiologic factors to prevent and control caries, periodontal disease and other oral conditions.

b. Control pain and anxiety during treatment through the use of accepted clinical and behavioral techniques.

c. Provide life support measures to manage medical emergencies in the patient/client care environment.

Evaluation

PC.5 Evaluate the effectiveness of the implemented clinical, preventive, and educational services and modify as needed.

This competency includes:

a. Determine the outcomes of dental hygiene interventions using indices, instruments, examination techniques, and patient/client self-report.

b. Evaluate the patient's/client's satisfaction with the oral health care received and the oral health status achieved.

c. Provide subsequent treatment or referrals based on evaluation findings.

d. Develop and maintain a health maintenance program.

Professional Growth and Development

PGD.1 Identify alternative career options within health-care, industry, education, and research and evaluates the feasibility of pursuing dental hygiene opportunities.

PGD.2 Develop management and marketing strategies to be used in non-traditional health care settings.

PGD.3 Access professional and social networks and resources to assist entrepreneurial initiatives.

Glossary

Access. This term refers to a mechanism or means of approach into the health care environment or system.

Acquire. See obtain

ADPIE. Process of dental hygiene care model incorporating assessment, diagnosis, planning, implementation and evaluation of services.

Assess. See Assessment

Assessment refers to the process of evaluation or appraisal of physical, written, and/or psychological data from a patient/client or a group in a systematic and comprehensive manner to make decisions about the oral and general health needs of the patient/client. [1,2]

Care Plan. An organized presentation or list of interventions to promote the health or prevent disease of the patient's/client's oral condition; plan is designed by dental hygienist and consists of services that the dental hygienist is educated and licensed to provide.

Client refers to the recipient of health care, including oral health care regardless of the state of health; can be an individual or group depending upon the circumstances in which the care is delivered, i.e. individual or community setting. [2,3]

Client-centered. Approaching services from the perspective that the client is the main focus of attention, interest, and activity; the client's values, beliefs and needs are of utmost importance in providing care.

Critical thinker. A habitually inquisitive individual, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information and persistent in seeking results which are as precise as the subject and circumstances of inquiry permit. [4]

Community group of two or more individuals with a variety of oral health needs including physical, psychological, cognitive, economic, cultural, educational, compromised/impaired persons. The community also includes consumers and health professional groups, businesses and government agencies.

Diagnosis (Dental Hygiene). Translation of data gathered by clinical and radiographic examination into an organized, classified definition of the conditions present; the conditions of either health or disease are ones that the dental hygienist is licensed and educated to treat.[3]

Dental Hygienist. A licensed health professional specializing in the prevention and treatment of oral diseases. Dental hygienists entering the profession must be graduates of an established institution of higher learning that has been accredited by an institutional accrediting agency.

Evaluate refers to the process of studying, classifying, or appraising procedures or programs for the prevention and management of oral diseases using measurable (quantifiable) standardized criteria (outcome measures).

Evidenced-based. A new paradigm for the delivery of health care which involves: defining the patients'/clients' problems; identifying the information required to solve the problem; conducting an efficient search of the literature; selecting the best of the relevant studies; applying the rules of evidence to determine validity; extracting the clinical message and presenting it to colleagues and applying the information to the patient/client problem.

Interventions (Dental Hygiene). Dental hygiene services rendered to clients as identified in the dental hygiene care plan. These services may be clinical, educational, or health promotion related.

Medicolegal "pertains to both medicine and law; considerations, decisions, definitions, and policies provide the framework for many aspects of current practice in the health care field."[2]

Obtain. Making data available through inspection, questioning, review of data, etc., or capturing data by using diagnostic procedures. Health histories, radiographs, casts, and consults are obtained. It is always assumed that the procedures for obtaining data are performed accurately so that no bias is introduced, are appropriate to the circumstances, are no more invasive than necessary, and are legal.

Patient. See client

Practice. To engage in the patient/client care activities of the dental hygiene profession.

Refer. Through assessment, diagnosis, and/or treatment it is determined that services are needed beyond the practitioner's competence or area of expertise. It assumes that the patient/client understands and consents to the referral and that some form of evaluation will be accomplished through cooperation with professionals to whom the patient/client has been referred. [1]

Risk factors. Attributes, aspects of behavior, or environmental exposures which increase the probability of the occurrence of disease.

Services (dental hygiene). The behaviors/actions of the dental hygienist in the provision of clinical therapies, health promotion, education and research to benefit patients/clients.

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Appendix E

Suggested Competency Document for the Baccalaureate Degree in Dental Hygiene at the Allied Dental Science Program Faculty of Applied Medical Sciences Jordan University of Science and Technology Irbid, Jordan

Introduction

Competencies for the Baccalaureate Degree in Dental Hygiene at the Allied Dental Science (ADS) program identifies and organizes the knowledge, skills, values and attitudes that the graduate must attain to become a competent entry-level practitioner and assume the dental hygiene roles as preventive clinician, oral health educator/promoter, administrator/ manager, consumer advocate, change agent, and researcher in real work settings. This document serves as the "blueprint" for the ADS curriculum improvement, implementation, and evaluation. The competencies in this document serve as guidelines for the selection and sequencing of the program courses, applying the desired integration of knowledge, skills, and professional values that graduates must possess to begin entry-level practice in natural settings, and assessing the program outcomes. The document will also facilitate communication among the faculty members and decision-making practices.

The competencies in this document represent the standards and expectations that the program and society have deemed essential for entry entry-level dental hygiene professionals to provide quality dental hygiene services and improve the oral health of Jordanian citizens. However due to the rapid changes and nature of the profession, and because no previous competencies are established for the dental hygiene graduates at the ADS program, the competencies delineated in this document require regular review, for continual improvement and implementation, by the ADS program director and faculty.

Organization

Domains

The organization of this document is designed to list competencies from the general, which reflects the central domains of the curriculum, to the specific, which comprise the foundational abilities (See Figure 4). The domains represent the broad categories of professional activity that occur in dental hygiene. The concept of domains is intended to encourage interdisciplinary integration of the curriculum content and structure. Three main domains are identified in this document:

I. Professionalism and ethics
II. Oral health promotion and disease prevention
III. Dental hygiene process of care

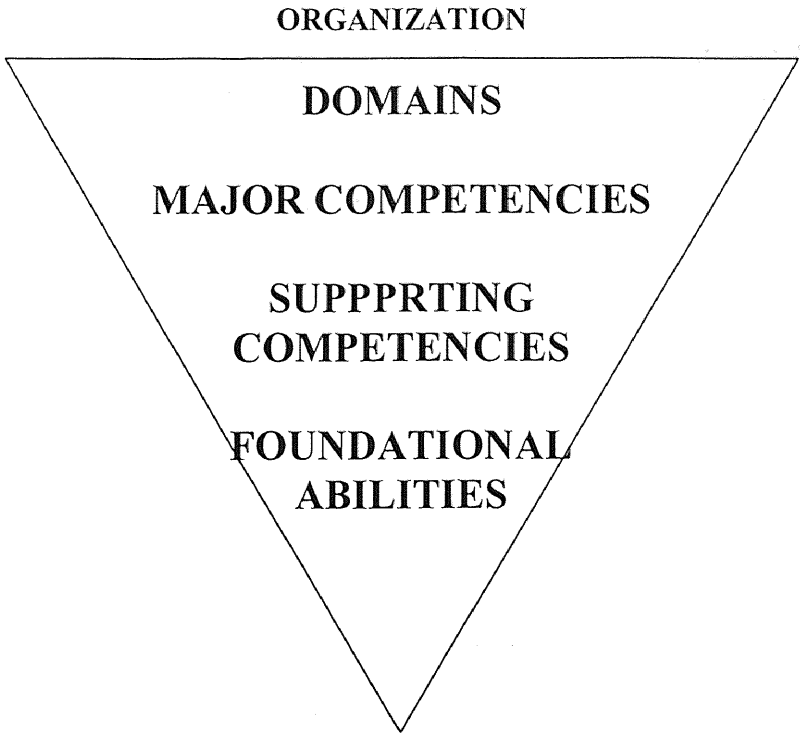

Figure 4. Organization of Competencies for the Baccalaureate Degree in Dental Hygiene.

Major Competencies

Within each domain, major competencies are identified. A *major competency* is defined as the ability to perform a particular, complex service or task that is cognitive, affective, and/or psychomotor in nature. The complexity of such services suggests that multiple and more specific supporting abilities are required, called *supporting competencies*, to facilitate the performance of the overall competency. Ten major competencies are identified (See Figure 3). Figure 3 represents an overview of the domains and major competencies.

Supporting Competencies

Supporting competencies are the specific abilities that must be acquired to enable the performance of any major competency. All supporting competencies related to a major competency must be mastered for the acquisition and demonstration of that competency. While less complex than a major competency, a supporting competency also requires foundational knowledge, skills, and attitudes. These constitute the educational outcomes of the basic, dental, and dental hygiene science courses.

Foundational Abilities

These are the foundational knowledge, skills, and attitudes that are attained through didactic, laboratory, pre-clinical, and clinical instruction and are required for satisfactory mastery of the supporting competencies.

Foundational knowledge is the ability to recite and apply the information and correctly answering questions on written, oral, or practical tests.

Foundational skill is the ability to perform a particular skill according to established guidelines or a prescribed process in standardized conditions, such as charting and recording probing depths and bleeding points on a partner, or performing fissure sealants on a model in a laboratory setting.

Foundational attitude is a positive, acceptable intellectual and behavioral action, such as obtaining informed consent from the patient prior to treatment implementation.

Foundational abilities are listed as course objectives in courses' syllabi and outlines. Therefore, they are not listed in this document. Foundational abilities represent the educational outcomes of the basic, medical, dental, and dental hygiene science courses, the psychological, clinical, and communication sciences. Didactic, small group, library, Internet, seminar, laboratory, case-based, web-based, and clinical instruction are the teaching and learning experiences that will be used to attain the foundational knowledge, skills (psychomotor, critical thinking and problem solving skills), and values to demonstrate competency in variant practice settings.

I. Professionalism and Ethics

1. Ethics and professional practice: the dental hygienists must be able to recognize and manage the ethical issues and dilemmas of dental hygiene practice in a rapidly changing environment.

   1.1 Apply ethical reasoning to dental hygiene and practice with professional integrity.

   1.2 Treat all individuals and population groups without discrimination and appreciate cultural diversity.

   1.3 Adhere to the Jordanian dental hygiene code of ethics and government's laws in all practice settings.

   1.4 Assume responsibility to dental hygiene practice and process of care in different employment practices.

   1.5 Demonstrate professional behaviors and communication skills.

2. Critical thinking and problem solving: the dental hygienist must be able to collect, synthesize, analyze, and apply information in a variety of settings.

   2.1 Critically evaluate and analyze publications, research articles, and new products pertaining to the health field and apply new knowledge in dental hygiene care and practice.

   2.2 Apply foundational cognitive, affective, and psychomotor skills in real work situations.

3. Professional development and growth: the dental hygienist must seek the development and growth of dental hygiene profession in Jordan by increasing the awareness of public to the important roles of dental hygienists.

   3.1 Assume responsibility for professional growth through continuing, lifelong learning.

   3.2 Increase the awareness of the public, government's educational and health ministries, and other professionals to the values and roles of dental hygiene profession in improving the oral health of Jordanians by attending professional meetings and presenting the dental hygienists in every opportunity available.

   3.3 Periodically evaluate self and colleagues' professional skill and knowledge.
   3.4 Be aware of the new changes or knowledge related to dental hygiene profession.

II. Oral Health Promotion and Disease Prevention

4. Oral health education and interpersonal communication: the dental hygienist must be able to promote the values of the total and oral health to the public and other professions.

   4.1 Educate patients concerning their risk factors and conditions and assist them in developing new self-care practices.

   4.2 Use learning principles for oral health education for patient of variant ages and health status.

   4.3 Support client welfare and quality of life by improving his/her oral health status, which is an integral part of the general health.

5. Community involvement: Dental hygienist must be able to promote the oral health and prevent dental diseases for different population groups and in different settings.

   5.1 Plan, implement, and evaluate community-based oral health education and prevention programs in a variety of settings.

   5.2 Increase the public's access to oral health care services by providing dental hygiene care services in a variety of settings for different population groups such as elderly, medically and mentally compromised, low income families, etc.

   5.3 Assess community oral health needs and risks then plan, implement, and evaluate programs for improving the oral health and increasing access to health care system according to the available resources.

III. Dental Hygiene Process of Care

6. Dental hygiene assessment: the dental hygienist must be able to systematically collect, analyze, and document data on medical, dental, pharmacological, and demographic histories as will as findings of oral examination.

   6.1 Establish open, comfortable communication with the patient by utilizing the psychological and interpersonal communication principles.

   6.2 Obtain and record complete medical and dental histories including the vital signs.

   6.3 Perform complete intra and extra-oral examination including hard and soft tissues.

6.4 Assess the needs for radiographs and correctly interpret radiographic findings.

6.5 Assess patient's needs and goals according to the data collected.

6.6 Identify and records patients medications, their effects on dental and periodontal health, and their impact on dental hygiene treatment.

6.7 Identify clients at risk for a medical emergency and take appropriate interventions and precautions to minimize the risks.

6.8 Establish and maintain accurate patient record, and review and update data in each visit.

7. Dental hygiene diagnosis: Dental hygienist must use critical thinking and decision-making sills to reach conclusions regarding patients' needs and sets goals and interventions accordingly.

   7.1 Perform accurate dental hygiene diagnosis according to data collected in the assessment phase and that is congruent with the dentist's and other health professionals' diagnosis.

   7.2 Make appropriate referrals and consultations with the patient's dentist and physician.

8. Dental hygiene planning: the dental hygienist must, with the collaboration of the client and other health professionals, establish comprehensive alternative dental hygiene care plans that compromise the dental hygiene interventions to be implemented to meet the predetermined patient's needs and goals and that are consistent with the dental hygiene assessment and diagnosis.

   8.1 Establish sequenced, planned dental hygiene treatment interventions including educational, preventive, and therapeutic services according to the identified patient's needs and goals.

9. Dental hygiene implementation: dental hygienist must be able to implement the planned dental hygiene treatment interventions in sequence and according to accepted standards of care.

   9.1 Educate the client about his/her oral health status and assist him/her to develop accepted self-care practices.

   9.2 Maintain accepted infection control protocol.

   9.3 Apply basic and advanced principles of dental hygiene instrumentation to remove deposits.

9.4 Provide adjunct dental hygiene services.

9.5 Utilize accepted psychological and behavioral technologies to maintain patient comfort and accepted clinical techniques to provide for pain and anxiety control.

9.6 Manage medical emergencies and maintain basic life support.

9.7 Select and administer appropriate chemotherapeutic agents and provide pre- and post-treatment instructions.

9.8 Recognize the need to adjust and modify the oral health care based on changing patient needs.

10. Dental hygiene evaluation and maintenance: The dental hygienist must be able to evaluate the effectiveness of the implemented dental hygiene care services.

10.1 Determine the outcomes of dental hygiene interventions using the appropriate evaluation techniques such as indices and examination.

10.2 Develop and maintain a periodontal maintenance plan according to the patient need and status.

10.3 Evaluate the patient's satisfaction with the dental hygiene care services provided and oral health status achieved.

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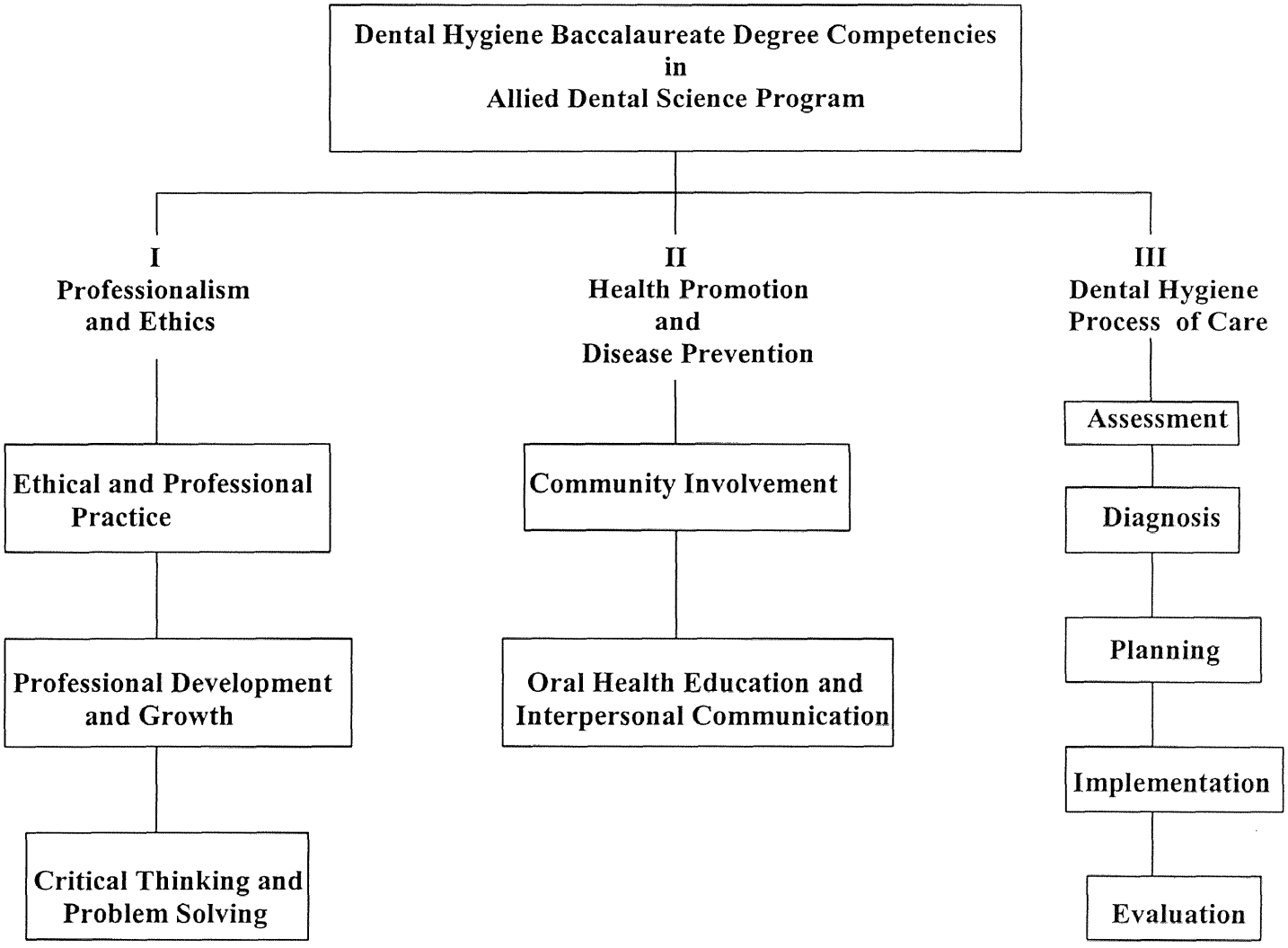
Figure 5. Domains and Major Competencies



Appendix F

CURRICULUM SUPPORT & ASSESSMENT OF COMPETENCIES
SCHOOL OF DENTAL HYGIENE
OLD DOMINION UNIVERSITY

Competency	Curriculum Content (Course Number)	Evaluation Method
1. Professional Behavior The dental hygiene graduate Must be able to practice in an Interdisciplinary team concept in a professional manner		
1.1 Assume responsibility and Accountability for dental hygiene Actions and services, according to Protocol	Professional accountability (300, 305, 306, 416)	written examination, debate, in-class activity, case studies, process and product evaluation
	Healthy life style (303)	in class assignment
	Post-operative instruction (300, 303, 305)	process and product evaluation
	Writing skill development (303, 415)	journal writing, written research proposal
	Legal regulatory, and ethical aspects of dental Hygiene (300, 416)	written examination, case studies
	Achieving professional status (416)	written examination, debates
	Personal values, beliefs, and attitudes (417)	goals statement, values clarification activity and oral presentation, written examination
	Dental Hygiene Practice (303,306,316,411,418,419)	process and product evaluations

Competency	Curriculum Content (Course Number)	Evaluation Method
1.2 Provide accurate, consistent, and complete documentation when serving in professional in professional roles	Documentation of clinical findings (300)	written examination
	Record keeping (301, 416)	practical exam, written examination
	Tooth nomenclature (302)	written examination, tooth drawings
	Head and neck anatomy (302)	written examination, identification activity
	Prescription writing (307)	written examination
	Treatment planning, informed consent, informed refusal, risk management (306,310,416,415)	written examination, research proposal
	Dental Hygiene Practice (301,306,316, 411,418)	process and product evaluation proposal
1.3 Communicate effectively using verbal, nonverbal written and electronic communication skills	Verbal/nonverbal communication (300,305,310, 410,414,417)	oral presentation, written paper, written examination, homework assignments
	Dental Hygiene care planning and evaluation (301, 306)	written paper, process examination, journal writing, homework assignments
	Special procedures, placement of intra-oral radiographs on patient partners, patient relations (309)	graded lab role play
	Special needs patients and conditions (410)	written examination, table clinics, paper evaluation
	Lesson planning and microteach development (414)	written feedback and faculty, peer, and self-Evaluation
	The library search (415)	written examination, & research proposal

Competency	Curriculum Content (Course Number)	Evaluation Method
	Use of email on-line discussion forum and internet activity (415, 414, 416)	participation in asynchronous on-line discussion forum
	Preceptorship vs formal education (416)	written examination, debate, case studies
	Education, regulation, licensure (416)	written examination, debate, case studies
	Managed care (416)	written examination, debate
	Roles in a team; interpersonal relationships (304, 309, 417)	written examination,; practice management paper, lab assistant assignment
	Negotiation skills (417)	written examination
2. Ethical Behavior. The DH graduate must be able to discern and manage the ethical issues faced in DH.		
2.1 Integrate the ADHA code of ethics in all professional endeavors	ADHA Code of Ethics (300,306,411,416,418)	written examination, case studies (all clinical product evaluation)
	Evidence-based decision-making (301,306, 411, 416,418)	written examination, process and product evaluations (clinical product evaluation)
	Ethical and legal issues in teaching, research, and Practice (300,414,415,416)	role play, article discussion, written examination, research proposal (section on human subjects), preparation of informed consent form, case studies (clinical product evaluation)

Competency	Curriculum Content (Course Number)	Evaluation Method
	Practice management principles in health care settings (306, 411, 417, 418)	Practice management paper, written examination (clinical product evaluation)
2.2 Adhere to local, state and laws, recommendations, and regulations for dental hygiene actions and services.	Professional role of the dental hygienist (300, 416)	written examination, case studies, clinical evaluations.
	Evidence-based decision making (300, 305, 306, 316, 411, 418)	written examination, clinical evaluations.
	Legal and ethical aspects of dental hygiene (303, 306, 309, 316, 411, 416,418)	written examination, lab process and product evaluation, case studies, clinical evaluations.
	Radiation protection (304, 306, 316, 411, 418)	written examination
	Jurisprudence (305, 416)	written examination, case studies
	Federal regulation, requirements (307)	written examination, in-class exercise
	Licensure information, national and regional examination requirements (417)	Licensure application, NDHBE application, regional examination dental chart written examination
2.3 Serve all clients without discrimination, appreciating the diversity of the population	Special needs patients (410)	written examination, process and product evaluation
	Evidence-based decision making (306)	Clinical process and product evaluations.
	Legal and ethical issues in health sciences research And dental hygiene practice (415, 416)	written examination, case studies

Competency	Curriculum Content (Course Number)	Evaluation Method
2.4 Apply principles of risk management to manage professional risks and prevent liability	Record keeping (300, 306, 316, 411, 416, 417, 418)	Clinical evaluation, written examination, case studies
	Infection control, personal protective equipment, Chemical safety (300, 301, 303, 304, 306, 309)	Practical and written exam, skill process daily evaluations
	Exposure limits, ALARA, Consumer Patient Act Of 1981, dose levels, radiation biology, operator/ Patient protection (304)	written examination
	Infectious disease (307, 410)	written examination
	Prevention of medical emergencies 410)	written examination, case studies
	Legal regulatory, and ethical issues in health sciences research and dental hygiene practice (415, 416, 417)	written examination, evaluation of informed consent document (research proposal evaluation)
	Rights of employers and employees based on the employee contract (417)	written examination, case study and analysis
3. Problem Solving & Decision Making. The dental hygiene graduate must be able to acquire, synthesize, and analyze information in a scientific and effective manner.		

Competency	Curriculum Content (Course Number)	Evaluation Method
3.1 Critically analyze published reports of oral health research and apply this information to the practice of dental hygiene	Evidence-based decision making (300, 310, 414, 415)	written paper, journal article critique, research article abstract, research proposal (review of litrature section)
	Oral health products and equipment (305, 306)	oral presentation; process evaluation, written examination
	Journal article critique (310, 414, 415)	written evaluation, research proposal, journal article critique
	Criteria for evaluation of clinical research studies (310, 415)	research article abstract, research proposal research article critique, research
	Special needs patients (410)	written paper
	Table clinic presentation development (410)	Table clinic evaluation
	Review of Literature (307, 415)	written examination, research proposal
	Library search, population, sampling techniques, Research design, measurement in research, data Analysis and interpretation (415)	written examination and in class critiques of 2 research articles; critiques of 5 research abstracts; exercises on internal and external validity of investigation; research proposal evaluation
	Evaluation of oral health literature (413)	written evaluation

Competency	Curriculum Content (Course Number)	Evaluation Method
3.2 Evaluate the safety and efficacy of oral health products, interventions, and treatments.	Abrasives, toothpastes, bonding agents, sealants, alginate, acrylics, and gypsum (303)	written examination; patient checklist
	Allergic reactions to dental products (303, 306 411, 418)	written examination, clinical evaluation.
	Oral health products and equipment (305, 306)	Oral presentation, written examination, Process and product evaluation
	Evidence-based decision-making (client, referrals) (305, 306)	Clinical evaluation, process and product evaluation
	Dental hygiene care evaluations (305, 306, 316, 411, 418)	case paper, process and product evaluation, clinical evaluation
	Indications, contraindications, and dental concerns of specific drugs (306, 307, 316, 411, 418)	in class assignments, written examination, process and product evaluation, clinical evaluation
	Dental indices (306, 316, 410, 411, 418)	written examination, process and product evaluation, clinical evaluation
4. Assessment. The dental hygiene graduate must be able to systematically collect, analyze and record data on the general, oral, and psych-social health status of clients using methods consistent with medico-legal-ethical principles.		

Competency	Curriculum Content (Course Number)	Evaluation Method
4.1 Asses client concerns, goals, values, and preferences to guide client care.	Medical history interview; care planning, dental hygiene diagnosis ((300, 305)	written examination, case paper, and case analysis.
	Dental hygiene practice (301, 306, 316,411, 417, 418)	Clinical process and product evaluations
4.2 Obtain, review, update, and interpret an accurate medical/dental history and vital signs, recognizing precautions or consideration prior to or during dental hygiene care.	Medical/dental history; vital signs; dental drug reference; medical emergency prevention (300, 307)	written examination, in-class assignment
	Dental hygiene practice (301, 306, 316,411, 417, 418)	Daily clinical evaluations (process and product); practical evaluations
	Principles and terminology in general pathology and terminology (308)	in-class assignment, written examination
4.3 Perform an extraoral and intraoral examination.	Intraoral and extraoral procedures (300)	written examination, oral presentations, demonstration
	Dental hygiene practice (301, 306, 316,411, 417, 418)	process and product evaluation, practical Evaluation
	Intra and extra oral anatomy (302)	written examination, class exercises
	Distinguishing features and oral manifestations of developmental, systemic, infectious, and neoplastic diseases (308)	written examination
	Clinical signs and symptoms of oral pathology (308)	in-class assignment, written examination

Competency	Curriculum Content (Course Number)	Evaluation Method
4.4 Perform an examination of the teeth and accurately record the results.	Dental exam procedures (300)	written examination, homework assignment
	Dental hygiene practice (301, 306, 316,411, 417, 418)	clinical process and product evaluations, practical examination
	Tooth anatomy (302)	written examination, tooth drawings
	Recognition of restorative materials (303)	lab process and product evaluation
	Dental caries and its sequela (308)	written examination
4.5 Evaluate the periodontium, and identify conditions that compromise periodontal health and function.	Periodontal assessment (300, 310)	written examination, case studies
	perform periodontal assessment and identify Conditions (301, 306, 316, 411, 418)	process and product evaluations, practical examinations, skill evaluations
	Normal periodontium (302)	written examination
	Histology (302)	written examination
	Perio and gingivitis assessment (310)	written examination, case studies
	Osseous dental irrigation (308, 417)	written examination
	Metal hypersensitivity and periodontal health (303)	written examination
4.6 Identify the need for radiographs and radiographically distinguish normal from abnormal anatomical findings.	Care planning (304, 305, 306, 316, 411, 418)	written examination, clinical process and
	Anatomical landmarks (302, 304)	written examination, laboratory assignments

Competency	Curriculum Content (Course Number)	Evaluation Method
	Radiographic appearance of tooth developments (304)	written examination, laboratory assignments, clinical process and product evaluation
	Radiographic interpretation (306, 309,316,411, 418)	written examination, laboratory assignments, clinical process and product evaluation
	Perio and radiographs (309, 310)	written examination, case studies, laboratory assignments
	perform a radiograph assessment (300, 304, 306, 316, 411, 418)	written examination, process and product evaluation
4.7 Recognize predisposing and etiological risk factors that require intervention to prevent and control disease.	Dental drug reference, assessment, oral health status (300)	written examination
	Dental hygiene practice (301, 306, 316, 411, 418)	process and product evaluations, examination process evaluation
	oral anatomy and tooth anatomy (302)	written examination
	Indication for sealants (303)	written examination
	Etiologic risk factors of systemic disease (308, 310)	written examination, case analysis, written case paper
4.8 Perform appropriate examinations to obtain, validate and interpret diagnostic information, recognizing advantages and limitations.	Dental hygiene practice (301, 306, 316, 411, 418)	daily clinic evaluations; practical evaluations
	Oral anatomy and tooth anatomy (302)	written examination
	Disclosing, care planning (305)	written examination

Competency	Curriculum Content (Course Number)	Evaluation Method
	Intraoral/Extraoral radiographics techniques (309) (304)	written examination, laboratory assignments
	Periodontal assessment (310)	written examination
4.9 Identify clients at risk for a medical emergency and take appropriate precautions to minimize those risks. .	Medical emergencies (300, 307) status (300)	written examination, practical evaluation, in class exercise
	Anti-infective agents (307)	written examination
	Special needs clients (410)	written examination
5. Diagnosis. The dental hygiene graduate must be able to use critical decision making skills to reach conclusions about the client's human needs related to oral health and disease, based on all available assessment data.		
5.1 Analyze and interpret the data to formulate a dental hygiene diagnosis related to and congruent with the dentist and other health professionals.	Dental hygiene diagnosis (300, 301, 305, 306, 316, 411, 418)	written examination, process and product evaluation, case studies
	Oral and tooth anatomy (302)	written examination, quizzes, drawings
	Sealant tooth selection (305, 306)	Clinical process and product evaluation
	Study models and diagnostic casts (303)	Clinical process and product evaluation
	Risk factors, diagnosis, human needs model, Treatment planning (310)	Clinical process and product evaluation, written case papers.

Competency	Curriculum Content (Course Number)	Evaluation Method
5.2 Obtain consultations as appropriate.	Medical history, medical and dental referrals (300 301, 306, 310, 316, 411, 418)	written examination, clinic process and product evaluation, case studies, process evaluation
6 Planning. The dental hygiene graduate must be able, through collaboration with the client and/or other health professionals, to formulate a comprehensive dental hygiene care plan. The care plan will delineate dental hygiene interventions to be provided that are evidence-based, and client-centered and related to the identified human needs deficits.		
6.1 Establish a planned sequence of educational, preventive, and therapeutic services, collaboratively with the client, based on the dental hygiene diagnosis.	Dental hygiene diagnosis, care planning (300, 305)	written examination,, care plan case paper
	Dental hygiene practice (301, 306, 316, 411, 418)	process and product evaluations
6.2 Formulate goals and establish expected outcomes related to the needs and desires of the client and the dental hygiene diagnosis professionals.	Dental hygiene diagnosis and care planning (300, 301, 305, 306, 316, 411, 418)	written examination, clinical process and product evaluation, care plan case paper
	Special needs, human needs (300, 301, 305, 306, 316, 411, 418)	written examination, case studies, clinical process and product evaluation
6.3 Make referrals to professional colleagues as indicated by the care plan.	Dental hygiene diagnosis, care planning (300, 305 306, 316, 411, 418)	written examination,, care plan case paper
	Dental hygiene practice (301, 306, 316, 411, 418)	process and product evaluation.

Competency	Curriculum Content (Course Number)	Evaluation Method
	Prescription writing (307)	written examination, in class exercise
7. Implementation. The dental hygiene graduate must be able to provide specialized care that includes educational, preventive, and therapeutic services designed to assist the client in achieving and maintaining oral health goals.		
7.1 Educate clients to prevent and control risk factors that contribute to caries, periodontal disease, and other oral conditions human needs related to oral health and disease, based on all available assessment data.	Disease risk factors (300, 305), Epidemiology of dental caries, perio, and other conditions (413)	written examinations
	Sealants, Impressions, Periodontal packs, inelastics, polishing agents (301, 303, 306, 311, 411, 418)	written examination, process and product evaluation
	Nutritional counseling, risk factors (310, 311, 411, 418)	Dietary counseling paper, written examination, process and product evaluation, case studies
	Osseous dental integration (417)	written examination
	Dental hygiene practice (301, 306, 316,411, 418)	Daily clinical evaluation; process and productevaluation
7.2 Utilize accepted infection control procedures.	Infection control (300)	written examination
	Dental hygiene practice (301, 304, 306, 309, 316, 411, 418)	laboratory assignments, written examiation, process and product evaluation.

Competency	Curriculum Content (Course Number)	Evaluation Method
7.3 Obtain radiographs of diagnostic quality.	Radiographic film processing, factors affecting radiographic image (304, 309)	written examination, laboratory assignments
	Radiographic techniques (304, 306)	process and product evaluation, written examination
	Dental hygiene practice (301, 306, 316, 411, 418)	daily clinic evaluations; practical evaluations
7.4 Apply basic and advanced principles of dental hygiene instrumnetation to remove deposits without trauma to hard or soft tissue.	Basic instrumentation skills (300, 301, 305, 306)	written examinations, skill evaluation, process evaluation
	Root debridement (310)	written examination
	Advanced ultrasonics (411)	written examination, clinic evaluaions
	Osseous dental integration (417)	written examination
7.5 Control pain and anxiety during treatment through use of accepted pharmacological and behavioral techniques.	Local anesthesia (302, 307)	written examination
	Dental cements (303)	process and product evaluation
	Topical anesthesia (305)	written examination, process evaluation
	Therapeutic communication (306)	process evaluation
	General anesthetics, analgesics, sedative hypnotics 307)	written examination
	Clinical management during radiographic procedures (304, 309)	laboratory assignments, role play, written examination.

Competency	Curriculum Content (Course Number)	Evaluation Method
	Advanced pain control techniques (417)	written examination
7.6 Select and administer the appropriate chemotherapeutic agent and provide pre- and post-treatment instructions.	Dental hygiene practice (301, 305, 306, 316, 411, 418)	daily clinic evaluations
	Toothpaste formulations, fluorides, sealants, tooth whiteners (303, 305, 316, 411, 418)	written exam, process and product evaluation
	Chemotherapeutics, local drug delivery (305, 310, 316, 411, 418)	written examinations
7.7 Provide adjunct dental hygiene services that can be legally performed in the commonwealth of Virginia.	Sealants, periodontal packs, impressions, topical anesthesia (306, 316, 411, 418)	written examination
	Trim, finish, and polish selective restorative materials (303)	process and product evaluation
	Desensitization, pulp testing, Perio-Chip (301, 306, 310, 316, 411, 418)	written examination, competency evaluations
7.8 Manage medical emergencies in the client care environment. pharmacological and behavioral techniques.	Medical emergencies (300, 307)	written examination, class analysis, in-class exercises
	CPR course (American Red Cross)	Demonstration, written examination
	Anti-infective agents (307)	in-class exercises, written examination
8. Evaluation & Maintenance. The dental hygiene graduate must be able to evaluate the effectiveness of implemented educational, preventive, and therapeutic services and modify as needed.		

Competency	Curriculum Content (Course Number)	Evaluation Method
8.1 Determine the outcomes of dental hygiene interventions using indices, instruments, examination techniques, and client self-report as specified in the client goals.	Oral health indices (300, 305, 310, 413)	written examination, product evaluation, case paper, clinical evaluation community project.
	Dental hygiene practice (301, 306, 316, 411, 418)	daily clinic evaluations; process and product product evaluation, community project, clinical process.
	Oral and tooth anatomy (302)	written examination
	Outcomes assessment, goal attainment, patient motivation (300, 305, 306, 310, 411, 418)	written evaluation
	Measurement in research (415) 316, 411, 418)	written examination, research proposal
8.2 Compare actual outcomes to expected outcomes, reevaluating goals, diagnoses and services when expected outcomes are not achieved	Oral health indices (305, 306, 419)	written examination, process and product evaluation, case paper
	Outcomes assessment, goal attainment, evaluation appointment procedures (305, 306, 310, 411, 418)	process and product evaluation, case paper, written examination
8.3 Develop and maintain a periodontal maintenance program.	periodontal maintenance program (310, 417)	written evaluations
8.4 Determine the client's satisfaction with the oral health care received and the oral health status achieved.	Measurement in research (415)	written examination
	Evaluating consumer satisfaction (417)	case study analysis and oral presentation, written examination

Competency	Curriculum Content (Course Number)	Evaluation Method
9. Education & Communication. The dental hygiene graduate must be able to promote the values of oral and general health to the public and organizations within and outside the profession.		
9.1 Identify factors that can be used to motivate the client for health promotion, disease prevention and/or health maintenance.	Risk factors (300, 305, 310)	written examination, case study
	Community health promotion and education (413)	written examination, oral presentation
	Dental hygiene practice (301, 306, 316, 411, 418)	process and product evaluation, skill evaluations
9.2 Educate other individuals and/or organizations about the assessment, access and delivery of services in the provision of oral health care.	Dental hygiene practice (301, 306, 316, 411, 418)	process and product evaluation
	Special needs/medically compromised (410)	written examination, case study
	Community dental health education (413)	group presentations, written examination
	Marketing dental hygiene services (417)	case analysis and group presentation; written examination
9.3 Present educational information to diverse client populations, in a variety of settings using appropriate teaching strategies.	Special needs/medically compromised (410)	written examination
	Lesson plan development (414)	written evaluation by faculty and peers
	Microteach development (414)	written evaluation
	Develop teaching aids for oral health education (413)	oral (peer) and written evaluation

Competency	Curriculum Content (Course Number)	Evaluation Method
	Oral health education development and Presentation (419)	written evaluation by faculty and peers, and self-evaluation
10. Community Involvement. The dental hygiene graduate must Be able to initiate and assume responsibility for health promotion and disease prevention activities for diverse populations in a variety of settings.		
10.1 Assess community oral health needs, risk and available resources and evaluate outcomes for health improvement and access to the	Preventive oral health methods (413)	written examination
	Selecting a popuation, sampling techniques and sample (415)	written examination, research proposal
	Measurement, data analysis & interpretation in research (415)	written examination, research proposal
	Electronic data bases & Internet web sites for health sciences (415, 416)	written examination, research proposal
10.2 Plan, implement, and evaluate community oral health education and services in a variety of settings.	Develop dental health programs (413)	written examination
	Community program planning (413)	written examination
	Measurement in research (415)	written examination
	Develop and present oral health educational Activity (413)	written peer evaluation

Competency	Curriculum Content (Course Number)	Evaluation Method
	Data analysis & interpretation process (415)	research proposal
10.3 Use screening, education and referral to introduce consumers to the healthcare system.	Marketing dental hygiene services (417)	case analysis and group presentation
	Community screening and education (419)	written evaluation
10.4 Provide dental hygiene services as an interdisciplinary healthcare member in a variety of settings.	Provide dental hygiene services in public health dept. and periodontal dept. (417)	self and supervisor evaluation of clinical rotation experience
	Provide dental hygiene services in public health settings (413, 419)	self and faculty evaluation
11. Professional Commitment. The dental hygiene graduate must be concerned with improving the knowledge, skills and values of the profession.		
11.1 Advance the values of the profession through leadership, service activities and affiliations with professional and public organizations.	Achieving professional status in dental hygiene (416)	written examination and debate
	Professional service and leadership (417, 419)	written evaluation
11.2 Assume the roles of the professional dental hygienist (clinician, educator, researcher, change agent, consumer advocate, administrator) as defined by the ADHA.	Health sciences research and professional development (415)	research proposal, debate
	Professional roles and responsibilities (300, 413, 416, 417)	written examination, debate, interview a practicing dental hygienist and written paper
	Quality assurance standards (416, 417)	interview a practicing dental hygienist and written paper, written examination

Competency	Curriculum Content (Course Number)	Evaluation Method
	Manager's role in resolving conflict & in ethical dilemmas (417)	written examination
	Characteristics of leaders and managers (417)	written examination
12. Professional Advancement. The dental hygiene graduate must Pursue new knowledge on a continual basis due to the changing health care environment.		
12.1 Assume responsibility for professional growth through lifelong learning.	Interviewing concepts (417)	written paper, written examination
	Resume development (417)	resume and cover letter development, written examination
	Career opportunities (417)	written job description and career opportunity Analysis, written examination
12.2 Evaluate professional issues and scientific literature in order to make evidence-based decisions that advance the profession of dental hygiene.	Evidence-based decision-making (415) Evaluation of oral health literature (413) professional issues (416)	-in-class critique of 2 articles -research proposal (review of the literature section) article critiques, debates

Appendix G

Curriculum Management Plan

The following plan details when and by what process curriculum review occurs in the school of Dental Hygiene and Dental Assisting. The Chair is responsible for seeing that proposed curricular changes are implemented.

- 3 meetings/semester for clinical curriculum review in addition to one final meeting at end of school year
- Review of students' course completion (end of each semester)
- Pre-academic year faculty meeting held annually in August
- Faculty retreat held annually in May
- Review of students' exit interview results (Faculty Retreat)
- Annual University assessment report, due in June of each year (reviewed at pre-academic year meeting)
- Review students' evaluation of courses (each semester)
- Review of competencies-curriculum matrix (Faculty Retreat)
- Program Review (every 5 years-completed in Fall semester)
- University Catalog/Course Description Changes (every 2 years-completed in Fall semester)

Updated May 2000

Curriculum Management Schedule

FALL

- Pre-academic Year Meeting (August) – Curriculum Update
- Clinical Meetings (monthly)
- Review Assessment Report (August)
- Course Completion Review (December)
- Students' Evaluation of Courses (December)
- Catalog Changes (every 2 years)
- Program Review (every 5 years)

SPRING

- Pre-semester Meeting (January)
- Clinical Faculty Meetings (monthly)
- Final Clinical Faculty Meeting (April)
- Course Completion Review (early May)
- Students' Evaluation of Courses (May)
- Faculty Retreat (mid-May)
    - Curriculum
    - Exit Interviews
    - Competencies
    - Course Completion Rates
    - Goals, Philosophy, Strategic Plan

SUMMER

- Assessment Report Due (June 1)
- Course Completion Review (late June)
- Students' Evaluation of Courses (August)

APPENDIX H

Jordan University of Science and Technology
Applied Medical Sciences Department
School of Allied Dental Science

Introduction to Dental Hygiene/ DH 101

Course Description

This course will introduce the students to the foundational concepts and theories of preventive and therapeutic dental hygiene services provided in clinical practice. The focus will be on theoretical knowledge of dental hygiene roles and functions, dental hygiene process of care, disease transmission, infection control, basic dental hygiene instrumentation, and ethical and professional behaviors.

Credit Hours: 3

Course Hours: Monday and Wednesday 10:00-10:15 a.m.

Co requisites: DH 102 (Pre-clinical DH Practice).

Pre-requisite: Oral anatomy and physiology

Course Level: Junior DH students, fall semester, 3rd year

Supporting Competencies:

1. Apply ethical reasoning to dental hygiene and practice with professional integrity.
2. Treat all individuals and population groups without discrimination and appreciate cultural diversity.
3. Assume responsibility for professional growth through continuing, lifelong learning.
4. Increase the awareness of the public, government organizations, and other professionals to the values and role of dental hygiene profession by attending professional meetings and presenting dental hygienists in every opportunity available.
5. Evaluate self and colleagues, professional skills and knowledge.
6. Educate patients on their risk factors and conditions and assist them in developing new self-care practices.
7. Use learning principles for oral health education for patient of variant ages and health status.
8. Establish open, comfortable communication with the patient by utilizing the psychological and interpersonal communication principles.
9. Obtain and record complete medical and dental histories including the vital signs.
10. Perform complete intra and extra-oral examination including hard and soft tissues.
11. Assess patient's needs and goals according to the data collected.

12. Identify and records patients medications, their effects on dental and periodontal health, and their impact on dental hygiene treatment.
13. Identify clients at risk for a medical emergency and take appropriate interventions and precautions to minimize the risks.
14. Establish and maintain accurate patient record, and review and update data in each visit.
15. Assess the needs for radiographs.
16. Perform accurate dental hygiene diagnosis according to data collected in the assessment phase and that is congruent with the dentist's and other health professionals' diagnosis.
17. Make appropriate referrals and consultations with the patient's dentist and physician.
18. Establish sequenced, planned dental hygiene treatment interventions including educational, preventive, and therapeutic services according to the identified patient's needs and goals.
19. Educate the client about his/her oral health status and assist him/her to develop accepted self-care practices.
20. Maintain accepted infection control protocol.
21. Apply basic and advanced principles of dental hygiene instrumentation to remove deposits.
22. Determine the outcomes of dental hygiene interventions using the appropriate evaluation techniques such as indices and examination.
23. Develop and maintain a periodontal maintenance plan according to the patient need and status.
24. Evaluate the patient's satisfaction with the dental hygiene care services provided and oral health status achieved.

Course Objectives:

Upon completion of this course students will be able to:

1. Discuss the six roles, responsibilities, and functions of dental hygienists.
2. Demonstrate professional and ethical behaviors in class through attendance, participation, and interest.
3. Describe proper infection control protocol and principles in clinical settings including personal protection, hand washing, dental unit cleaning and disinfection, and sterilization.
4. Discuss methods of disease transmission, including HIV, tuberculosis, viral hepatitis, and herpes infection, and identify intervention processes during patient care to prevent transmission.
5. Explain effective sterilization methods, advantages and disadvantages of each method.
6. Describe the correct patient, operator, and light positioning (body mechanisms) in clinical DH practice.
7. Identify the different parts, designs, and classification of instruments used in DH practice.
8. Identify the basic principles of DH instrumentation including instrument grasp, finger rest, instrument adaptation, activation, and angulation.
9. Discuss the five phases of DH care process.
10. Describe appropriate assessment techniques used to collect data on patient case including:
    - Patient chief complaint
    - Drug referencing

- Medical, dental, and family histories
- Vital signs
- EOE and IOE
- Dental and periodontal charting
- GI, bleeding, and PI
- Tooth mobility, CAL, and furcation involvement

11. Discuss the main features and use(s) of dental explorers, sickle scalers, universal and gracey curets.
12. Identify effective plaque control aids such as brushing, flossing, interproximal cleansing aids, OHI and patient education, etc. based on patient needs.
13. Explain the composition of dental deposits including material Alba, plaque, calculus, acquired pellicle, stain, etc.
14. Discuss the protocol for maintenance and care of dental restorations and prosthesis.
15. Identify the etiological factors, classification, and diagnosis of dental caries.
16. Describe sharpening procedure of sickle scalars, universal, and gracey curets.
17. Define periodontal debridement, scaling, and polishing used to treat periodontal diseases.
18. Describe the clinical appearance of healthy and inflamed gingiva and periodontal tissue.
19. Identify effective methods for calculus detection and removal.
20. Discuss the effective methods used for extrinsic stain removal.
21. State the methods used for plaque assessment and detection including disclosing agents, and PI.
22. Identify and explain the uses of Hoe, File, and Chisel instruments.
23. Appreciate the value of applying ethical and professional principles to dental hygiene practice.

Course Requirements:

1. Reading assignments: students are expected to complete the reading assignments mentioned in the course schedule prior to each lecture. All reading material will be included in the course quizzes and tests.

2. Quizzes: ***four*** quizzes will be given in the date assigned for each quiz in the course schedule.

3. Small-group case-study paper: students will be divided into small groups of 3-4 students in each group. Each group will be assigned a patient-case and required to analyze and study that case and develop a DH assessment, diagnosis, and treatment plan according to the information provided for each case.

4. Case-study paper presentation: Each group will present their case study paper to the entire class during the assigned presentation date. All group members must participate in the presentation.

5. Plaque Control Aids Presentation: each student will select a technique of plaque control (e.g. brushing, flossing, rinsing, etc.) from a list provided by the instructor, and present that technique to the class. Each student will be given 10-15 minutes.

6. Drug referencing assignments: four drug referencing assignments students will complete in an individual basis using Mosby's Dental Drug Reference. Students will be asked to identify the drug name, dosage, indication(s), contraindications, side effects (if any), oral manifestations, and dental considerations before, during, and/or after dental care delivery. Assignments must be submitted to the course instructor in the assigned due dates.

7. Final Exam: comprehensive final examination will be administered in the final exams week.

Methods of Evaluation:

1. 4 quizzes @ 10% each	40%
2. Case study paper	15%
3. Case study paper presentation	5%
4. 4 Drug referencing assignments	10%
5. Homework assignments & participation	5%
6. Final Examination	25%

Grade scale:

100 – 90%	A
89 – 80%	B
79 – 70%	C
69 – 60%	D
< 60%	F

A grade of **C** is required for student to successfully pass this course and move to DH Theory I (DH103) and Clinical DH practice I (DH 104)

Required Text Books:

1. Wilkins, E. (1999). *Clinical practice of the dental hygienist.* 8th ed., Philadelphia, Lea and Febiger.
2. Nield-Gehrig, J.S. (2000). *Fundamentals of periodontal instrumentation.* 4th ed., Philadelphia, Lippincott Williams and Wilkins.
3. Gage, T., and Pickett, F. (2002). *Mosby's dental drug reference.* 6th ed., St Louis, Mosby.
4. Darby, M.L., and Walsh (2003). *Dental hygiene theory and practice.* 2nd ed. Philadelphia, Saunders.

Optional Text Book:

1. Thomson, Bauman, Shuman, and Andrews (2003). *Case studies in dental hygiene.* Upper Saddle River, NJ: Prentice Hall.

APPENDIX H

Jordan University of Science and Technology
Applied Medical Sciences Department
School of Allied Dental Science

DH 101 Class Schedule

Date	Lecture topics/learning activities	Assignments
1. Monday	Course & students Introduction Review course outline & syllabus Health promotion & CPR	Orientation
Wednesday	DH profession - DH 6 roles, responsibilities - DH scope of practice/services - DH practice settings - Types of Supervision: general, direct, personal - DH care process (introduction)	Wilkins Ch.1 *Darby & Walsh* Ch. 1, 7 ***Class Discussion:*** Reasons/ objectives for the selection of DH profession.
2. Monday	Transmissible diseases - AIDS, Tuberculosis, Hepatitis, Herpes infection - Ways of disease transmission: patient-to-patient, patient to operator, operator to patient - Microorganisms of the oral cavity	Wilkins Ch.2
Wednesday	prevention of disease transmission/Exposure Control -Barriers for pt. & clinician Personal protection: gloves, facemask, glasses, gown Immunization -Effective methods of hand washing	Wilkins Ch.3
3. Monday	Infection control/Clinical procedures -Surface cleaning -Disinfections -Sterilization	Wilkins Ch.4
Wednesday	**Quiz #1**	**Study Well!!!**
4. Monday	-Quiz #1 review	

	-Patient interviewing (reception & positioning) -Effective communication skills -M/D History & vital signs -Patient/operator/ light positioning	Wilkins Ch.5, P 81-85 Darby & Walsh Ch 5, P. 75 - 86 *Nield P. 15-43*
Wednesday	Assessment -Medical/dental history: Medical conditions -Management of dental emergencies -Dental drug reference use * **Small-group activity:** drug reference exercise	Wilkins Ch.6, 7 Bring Mosby's Dental Drug Reference book
5. Monday	-EOE & IOE -Use of dental mirror and compressed air -Basic instrumentation principles: grasp, fulcrum, for dental mirror, salivary moisture control Assignment; case HH & vital signs	Drug reference assignment 1 **Due** *Nield P.49-55, 63-115, 117-141, 143-165* Wilkins Ch.8, 12, 32
Wednesday	-Gingival and periodontal description and assessment -Periodontal probing and charting/ periodontal probe -Gingival, periodontal indices	*Nield P. 257-297* Wilkins Ch.12
6. Monday	-Dental deposits: acquired pellicle, material alba, plaque, calculus, dental stains -Explorers and their use *Calculus detection* -Use of disclosing agent ***Case Discussion***	**Case Assignment Due** *Nield P. 301-324* Wilkins Ch.12, 16, 17, 18
Wednesday	**Quiz #2**	**Study Well!!!**
7. Monday	-Quiz #2 review -Instrument design, classification, -Instrument adaptation, activation, and angulation - Instrumentation strokes Drug Reference assignment 2 **Due**	Bring your instruments kit *Nield P. 169-182, 183-255* Wilkins Ch.32
Wednesday	-Sickle scalars -Universal curets: 2R/2L, 4R/4L -Hoe, Chisel, and File scalars	Bring your instruments kit to class Wilkins Ch.32 Nield P. 327-367

8. Monday	- Gracey curets: 1/2, 3/4, 6/7, 11/12, 13/14 **Class activity:** Instrument selection (Nield P. 437) ***Discuss:*** Case-study paper criteria	Drug Reference assignment 3 **Due** *Nield P. 371-395* Wilkins Ch.32
Wednesday	Dental Caries -Etiology -Classification -Clinical and radiographic assessment (detection)	Wilkins Ch.14 *Nield P. 323*
9. Monday	Dental Assessment and Charting -Inspection of teeth, restorations, dental caries -Occlusion evaluation -Fractures of teeth, erosion, attrition, abrasion -Testing of pulbal vitality -Need for referral	Wilkins Ch.14,15 **Dental Charting Exercise:** use of charting symbols
Wednesday	**Quiz #3**	**Study Well!!!**
10. Monday	Quiz #3 review DH Diagnosis and patient's needs **Case studies (Sample Plan)**	Drug Reference assignment 4 **Due** Wilkins Ch.21
Wednesday	Instrument sharpening I – sickle scalars -Procedure, armamentarium	*Nield P. 407-429* Wilkins Ch.32
11. Monday	Instrument sharpening II- gracey and universal curets	Case-Study Paper **Due** *Nield P. 407-429* Wilkins Ch.32
Wednesday	Plaque Control Aids (Oral infection control)	**Student presentation** Wilkins Ch.23, 24
12. Monday	Plaque Control Aids (Cont.)	**Student presentation** Wilkins Ch.23, 24
Wednesday	DH planning Health promotion & disease prevention/ OHI and patient education Smoking Cessation Model	Wilkins Ch.22
13 Monday	**Quiz #4**	**Study Well!!!**
Wednesday	Quiz #4 review Extrinsic stain removal	Wilkins Ch.38

	-Air Polishing -Rubber cup/prophy-jet polishing, floss, Topical fluoride application	
14 Monday	Care and maintenance of dental restorations and prosthesis	Wilkins Ch. 25, 40
Wednesday	Ethical principles of DH practice ***Small group activity:** decision-making in ethical issues/dilemma in DH practice	Wilkins Appendix 1
15 Monday	**Case study paper presentation**	prepare well!!!
Wednesday	**Case study paper presentation (Cont.)** Course review	prepare well!!!
Final exams week	**Final Examination**	**GOOD LUCK!!!**

Appendix I

Jordan University of Science and Technology
Applied Medical Sciences Department
School of Allied Dental Science

Pre-clinical Dental Hygiene Practice/ DH 102

Credit Hours: 3 (6 hours per week)

Course Hours: Tuesdays and Thursdays 9:00 – 12:00 noon

Course location: JUST – Educational Dental Health Center

Course Level: 3rd Year, Junior DH students, 1st Semester

Course Description:
Practical application of the fundamental concepts, theories, and principles of dental hygiene practice covered in DH 101. Emphasis is placed on mastering basic skills necessary for providing dental hygiene services to clients including dental hygiene process of care and basic instrumentation.
Students must successfully complete this pre-clinical practice to move to the clinical aspect of the program where they start providing dental hygiene services to patients.

Methods of Delivery:
Demonstrations, seminars, preparation-reading assignments, supervised pre-clinical practice on student partners and Dentoforms.

Required Text Books:

1. Wilkins, E. (1999). *Clinical practice of the dental hygienist.* 8th ed., Philadelphia, Lea and Febiger.
2. Nield-Gehrig, J.S. (2000). *Fundamentals of periodontal instrumentation.* 4th ed., Philadelphia, Lippincott Williams and Wilkins.
3. Gage, T., and Pickett, F. (2002). *Mosby's dental drug reference.* 6th ed., St Louis, Mosby.
4. Darby, M.L., and Walsh (2003). *Dental hygiene theory and practice.* 2nd ed. Philadelphia, Saunders.

Optional Text Book:

5. Thomson, Bauman, Shuman, and Andrews (2003). *Case studies in dental hygiene.* Upper Saddle River, NJ: Prentice Hall.

Course Requirements:

1. **Pre-clinical Process/Performance Evaluations:**
   A. Cubicle preparation
   B. Prevention of disease transmission (infection control):
      1) Personal protection and hand washing
      2) Unit/surface cleaning and disinfection
      3) Sterilization
   C. Dental hygiene assessment techniques:
      1) Medical, dental, and family history
      2) Vital Signs:
         - Pulse rate
         - Blood pressure
         - Respiration rate
      3) EOE
      4) IOE
      5) Dental and periodontal charting
      6) Occlusion evaluation
   D. Disclosing agent and PI
   E. GI, BOP index and other assessment indices
   F. Extrinsic stain removal (polishing): brushing and rubber cup/prophy paste
   G. OHI

2. **Basic Instrumentation Skills/Principles:**

	Nield page
A. Patient/operator/light positioning	45, 47
B. Instrument modified pen grasp	61
C. Finger rest/fulcrum, use of mirror and compressed air	115, 167
D. Instrument design and classification	215
E. Instrument adaptation, activation, and angulation	227, 239
F. Instrumentation strokes	255
G. Periodontal probes and assessment skills	298, 299
H. Explorers: Calculus detection/ use of ODU 11/12 explorer	325
I. Sickle scalars, and universal curets	335, 347, 367, 369
J. Gracey/area specific curets (1/2, 11/12, 13/14)	395, 397
K. Instrument Sharpening	429

3. **Student attendance and responsibility:**
   See "Statement of Student Responsibilities and Accountabilities" (JUST Catalog)

   For necessary *accused absence* e.g. family emergency, extreme illness, etc., please *contact course instructor immediately.* Session missed must be made on extra laboratory sessions. The students must complete written make up session request within a week from that absence. Final decisions to make up sessions will be determined by the instructor. *Unexcused absence* will result on a *5 points deduction* from the overall course grade.

4. **Clinic sessions begin immediately at 9:00 a.m.:**
   Students are expected to arrive to clinic no later than *15 minutes prior* to the scheduled clinic time. Students are required to be prepared with hand washed and gloved, unit cleaned and disinfected and equipment set up prior to the beginning of the session.

5. **Pre-clinic sessions are scheduled for 3 full time hours:**
   Students must *not leave* clinic early without permission from their assigned faculty.

6. **Daily Skills/ Process Evaluations:**

   - **Faculty Evaluation:**

   Student progress will be observed and assessed on a daily basis by the assigned faculty. The faculty will provide feedback on student's strengths and weaknesses as needed and discuss that with the student. Daily progress of the skills and processes practiced will be recorded on the **skill evaluation forms** as *Satisfactory* (S) or *Unsatisfactory/Needs Improvement* (I). Unsatisfactory process evaluations indicate a student's needs for **remediation** with additional assistance. Satisfactory evaluation indicates a student readiness to move to the next skill. Such evaluations will be for feedback and will not be included in the course grade. However completion of all assigned skills process evaluations is required to successfully complete this course and move to DH 103 and 104.

   - **Self Evaluation:**

   Student should describe the experience, list strengths and weaknesses, and suggestions for improvement.

   - **Peer Evaluation:**

   Student partners will evaluate each other in teamwork skills including organization, preparedness, contribution of ideas and feedback, carrying a fair share, maintaining infection control protocol, readiness, and willingness to help others.

   Once completed, all evaluation forms, including faculty, self and peer, must be placed in a **progress notebook** assigned for each student. The notebooks are to be used by the section faculty to provide written feedback when necessary.

   The progress notebook will also evaluated based upon **client education materials** (professional reference) kept in plastic sleeves. Students are required to collect/develop such handy reference materials immediately.

7. **Documentation:**
   Prior to practicing skills on partners, complete **medical history** must be completed and signed by the instructor. **Services rendered** for that section must be documented in pen and signed by the instructor. **DH treatment Plan** must be documented in pencil.

8. **Cubicle Report Form:**
   Each student is responsible for his/her assigned cubicle each session. Student will be evaluated regarding their assigned cubicle status at the end of each session.

9. **Clinic Assistant Responsibilities:**
   Clinic Assistant assignments are clinical learning requirements for every student. These will include: Office, Sterilization, and Radiographic Assistant. Points will be deducted from final grade if responsibilities are not fulfilled and met.

Methods of Course Evaluation:

1. Nine Performance/ Practical Evaluations = 90% (10% each)

Nine Performance/ Practical Evaluations will be conducted on the assigned scheduled dates during the semester. These evaluations will be based on the instructor observation and rating/judgment of the student's performance of the assigned skill. Student's demonstration of the skill according to the specified criteria will be considered satisfactory completion of that skill and a grade will be given accordingly.

The instructor will give the assigned area for practical assessments to the students at the beginning of the session. The evaluation will be based on the student's first skill performance. *Students are not allowed under any conditions to practice skill to be evaluated during the practical evaluation day.* A grade of **80% or above** is required for each practical exam. Students receive <80% on any practical exam must be **re-evaluated** in another exam date to ensure minimal competency. *5 points will be deducted for each reevaluation* required for a practical exam.

2. Clinical Assistance Responsibilities and Cubicle Report Form = 5%

3. Self, Peer, and faculty evaluation forms and Progress Notebook = 5%

Grading Scale:

100 – 90%	A
89 – 80%	B
79 – 70%	C
69 – 60%	D

Student must achieve a "**C**" grade in this course to be able to continue in the program and register for the next courses, Dental Hygiene Theory I (DH 103) and Clinical Dental Hygiene I (DH 104).

Course Objectives:

1. Display professionalism and ethical attitudes and behaviors in working with peers and faculty.

2. Comply with the course policies, protocols, and procedures mentioned in the course syllabus including attendance, punctuality, dressing, and effective time utilization.
3. Demonstrate proper infection control and disease transmission prevention techniques including personal protection, hand washing, cubicle cleaning and disinfection, and instrument sterilization prior, during, and subsequent to treatment.
4. Identify the components and functions of the dental unit and chair.
5. Display appropriate patient/operator/ and light positioning principles during patient care.
6. Perform complete and accurate dental hygiene assessment including:
    - Medical/Dental history and drug referencing (DDR).
    - Vital signs: pulse, respiration, and blood pressure.
    - Complete extra-oral and intra-oral, soft and hard tissue, examination utilizing correct palpation and inspection techniques.
    - Occlusion evaluation.
    - Dental and periodontal charting
    - Gingival and periodontal assessment and description
    - Dental deposits (plaque, calculus, stain) assessment

7. Apply correct dental hygiene instrumentation techniques including modified pen grasp, intra-oral and extra-oral, hard and soft tissue fulcrum/finger rest, adaptation, activation, and angulation.
8. Demonstrate effective utilization of the dental mirror (for retraction, direct and indirect vision) and compressed air (for calculus detection and moisture control) during assessment and treatment.
9. Exhibit effective use of the dental explorers for calculus, caries and tooth anatomy detection.
10. Demonstrate correct sickle scalers, universal and gracey curets adaptation, activation, and angulation for supra- and sub-gingival calculus removal.
11. Display effective interpersonal communication and interview techniques in obtaining or updating medical/dental history.
12. Identify patients with medical conditions or medications that necessitate special consideration prior to or during dental hygiene care process.
13. Perform correct and complete documentation of data obtained on the patient's record using appropriate symbols and procedures.
14. Maintain a clear operative field and moisture control using compressed air, gauze, cotton rolls, and saliva ejector.
15. Correctly detect and differentiate dental deposits including plaque, calculus, and stain utilizing disclosing agents, explorers, compressed air, visual examination, and tactile sensitivity detection.
16. Identify the need for and effectively sharpen sickle scalers, universal curets and area specific curets.
17. Assess and remove extrinsic stain from teeth using prophylaxis paste and rubber cup (polishing).
18. Assess the need for and effectively apply topical fluoride to teeth.
19. Display effective OHI and education techniques to patients according to the individualized patient's needs and dental hygiene assessment.
20. Appreciate the value of team work, self and peer evaluation.

Appendix I

Jordan University of Science and Technology
Applied Medical Sciences Department
School of Allied Dental Science

DH 104 Class Schedule

Date	Lecture topics/learning activities	Assignments
1. Tuesday	Introduction into the course Orientation into the clinic Components, functions of dental cubicle and chair	
Thursday	- Dress code/ protocol - Progress Notebook and educational materials **Demonestation:** - Hand washing, personal & patient protection - Unit & surface cleaning, disinfection - Barrier placement - Unit setup	Wilkins Ch. 3, 4 **Required material:** Progress Notebook Clinical Manual Gown, Glasses
2. Tuesday	**Demonstration:** - Infection control during appointment - Infection control between patients - Infection control at the end of day - Clinical Assisting responsibilities	Wilkins Ch.3, 4 Clinic Manual ***Explore:*** http://www.ada.org/prac/position/post-ex.htm http://www.ada.org/prac/position/blood.htm
Thursday	-Instrument cleaning and sterilization (in sterilization room) -Instrument packaging and storage -Partners Practice: CA (office, sterilization, Radio.)	Wilkins Ch.4 Clinic Manual ***Explore:*** http://www.ada.org/prac/info/ic-resc.htm
3. Tuesday	**Partners Practice; Self, Peer & faculty evaluation** *Infection control/ Clinical procedures -Unit/ surface cleaning -Unit/ surface Disinfections -Instrument cleaning & sterilization	Evaluation forms completed placed in progress notebook

	*Handwashing, gloving	
Thursday	**Practical Examination #1** (Infection Control) Discussion: Transmissible diseases	☺ Wilkins Ch. 2
4. Tuesday	Dental hygiene Assessment Phase **Demonestration:** -Patient interviewing (reception, seating) -Medical/dental/family History, vital signs -Documentation -patient/operator/light positioning	Wilkins P. 81-85 Clinical Manual Nield P. 15-43 Pencil, colored pens (red, black, blue)
Thursday	* **Partners Practice/ self, peer, faculty evaluation** -Medical/dental history -Vital signs -Drug dental reference (Use of DDR) *Case simulations (Role playing) & discussion ***Emergency Kits: components & use**	Wilkins Ch.6, 7 Clinical Manual Wilkins Ch.61
5. Tuesday	-Patient/operator/light positioning -Extra-oral Examination -Basic instrumentation principles: grasp ***Practical Examination #2 (M/DH, Vitals)** ☺☺	Nield P. 15-43, 49-55 Clinical Manual
Thursday	*Dental mirror & compressed air -Grasp, Fulcrum/finger rests -Uses & parts of instrument -Salivary moisture control/ Isolation **Partners Practice & Evaluation**(positioning, use of Dental mirror & compressed air)	Nield Modules 4,5 ,6 P.63-115, 117-141, *143-165* Clinical Manual
6. Tuesday	IOE: *Gingival & Periodontal Charting* -Gingival & periodontal description and assessment -Periodontal probing and charting/ periodontal probe -Gingival, periodontal indices **Partners Practice & Evaluation**	Clinical Manual Nield Module 12 P. 257-297
Thursday	**Practical Examination #3 (Dental mirror & Compressed air, positioning)**☺☺☺ **Partners Practice & Evaluation**(Gingival & periodontal charting)	
7. Tuesday	IOE: Dental deposits detection, Explorers	Nield Module 13

	-Disclosing agent use & plaque, PI -Supra & sub gingival Calculus detection: Dry teeth, 11/12 explorer, tactile sensitivity, color **Partners Practice & Evaluation**	P. 301-324 Clinical Manual
Thursday	IOE: Dental assessment & charting -Exploring, caries detection & charting -Occlusion assessment -Inspection of teeth & restorations -Tooth mobility assessment **Partners Practice & Evaluation**	Nield Module 13 Clinical Manual
8. Tuesday	**Partners Practice & Evaluation:** Comprehensive DH assessment -Instruments identification, design, adaptation, & activation	Clinical Manual Nield P. 169,-182, 183-214, 217-226
Thursday	**Practical Examination #4 (DH assessment)** -Instrumentation strokes -Use of sickle scalers: adaptaion, angulation, & activation **Partners Practice & Evaluation** (Sickle scalers)	☺☺☺☺ Nield P. 241-254, 327-347
9. Tuesday	-Use of universal curets -Use of anterior gracey curets **Partners Practice & Evaluation** (Sickle scalers, universal & anterior curets)	Nield P. 349-367 371-381 Clinical Manual
Thursday	**Practical Examination #5** (sickle scalars & universal curets) ☺☺☺☺☺ -Use of 11/12 & 13/14 gracey curets (Post. Teeth) **Partners Practice & Evaluation**	Clinical Manual Nield P. 382-395
10. Tuesday	**Partners Practice- all instruments** Discussion: Scaling, R/P, debridement, difficulties, in instrumentation & problem identification	***Self Evaluation Paper*** (difficulties, weaknesses, strengths, suggestions for improvement) Nield P. 399-406, 505-513
Thursday	**Practical Examination #6 (Ant. & post. gracey curets)** ☺☺	

	Calculus Removal Plan	Nield P. 432-441
11. Tuesday	Instrument sharpening- all instruments **Students practice & evaluation**	Nield Module 19 Clinical Manual
Thursday	**Partner Practice:** -Medical/dental history (update) -vital signs -EOE -Positioning, mirror & compressed air use -Patient referral & consultation with other health professionals	Clinical Manual
12. Tuesday	**Partner Practice:** -Teeth, caries, restoration inspection & Dental charting -Occlusion assessment -Periodontal Charting **Demonstration**-OHI, brushing, flossing	Clinical Manual Patient Educational Material
Thursday	**Partner Practice:** Dental Deposits Assessment -Disclosing & plaque detection -Calculus detection -Stain assessment - OHI, brushing, flossing **Demonstration**-Testing of pulbal vitality	Clinical Manual Patient Educational Material
13. Tuesday	**Practical Examination#7 OHI, Brushing, Flossing** **Partner Practice:** All instruments	☺☺☺ Clinical Manual
Thursday	**Demonstration** Extrinsic Stain Removal-Polishing, flossing, fluoride **Partner Practice & Evaluation**	Clinical Manual
14. Tuesday	**Demonstration** Maintenance & care of dental prosthesis -Partial & complete dentures -Bridges, orthodontic appliances **Partner Practice: polishing, topical Fl application** ***Discussion:*** ADHA position on selective polishing	Wilkins Ch.25, 40, 41 Clinical Manual
Thursday	**Practical Examination#8** Polishing & Fluoride Application ☺☺	

	Partner Practice: -sickle scalers -universal & gracey curets -explorers -periodontal probe	
15. Tuesday	**Partner Practice:** -Medical/Dental history, vital signs -IOE & EOE -Deposit detection	
Thursday	**Practical Examination #9:** EOE & periodonatal charting **Partner Practice:** All instruments Instrument sharpening	