**Dental Technician**

**Course Syllabi**

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| **Course** | **Intro in Digital Dentistry** |
| Type | Semester | ECTS | Code |
| OBLIGATORY (O) | 4 | 4 |  |
| **Course Lecturer** | Arber Prokshaj |
| **Course Assistant** |  |
| **Aims and Objectives** | * This course provides an efficient approach to patient care and introduces innovative approaches to preclinical and clinical dental education.
* It also provides a look at how dental technology can help diagnose and treat patients with a variety of needs, from restorative dentistry to implant therapy and beyond.
* In addition, it provides a systematic learning approach for integrating digital measurement systems and CAD/CAM technology into dental laboratories and clinics.
* The focus of this course is to discuss the benefits and drawbacks of these technologies and how digital dentistry can be practiced in dental clinics.
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| **Learning outcomes** | After successful completion of this course, students will be able to:* Demonstrate the decision-making process in the appropriate selection of the system and diagnostic tools for the patient
* Discuss possible digital measurement and CAD/CAM technologies
* Understand how preparation design affects the manufacturing/milling and grinding process
* Restorations work
* Plan and design single teeth through CAD/CAM
* Understand the possible materials for chairside restorations
* Demonstrate workflow skills to operationalize CAD/CAM technologies in practice
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| **Alignment of Course’s Learning Outcomes to Programs’ Learning Outcomes.** | Aligning the course's learning outcomes for "Intro in Digital Dentistry" with the program's learning outcomes for the Dental Technician, Bachelor level, ensures that the course contributes effectively to the overarching educational objectives of the program. Here's how the specific learning outcomes of "Intro in Digital Dentistry" map onto and support the achievement of the program's broader learning outcomes:1. **Comprehensive Understanding of Fixed Prosthodontics:**

Aligns with Program Outcome on Knowledge and Understanding: This outcome supports the program’s aim to equip students with a solid foundation in dental technology, including understanding key principles and techniques.1. **Practical Proficiency in Prosthodontic Techniques:**

Aligns with Program Outcome on Practical Skills: Directly contributes to the program’s objective of developing hands-on skills in dental laboratory procedures, ensuring students are prepared for real-world dental technology tasks.1. **Research and Critical Thinking Skills:**

Aligns with Program Outcome on Research and Innovation: Enhances the program’s goal of fostering an environment that encourages engagement with research, critical analysis, and innovation within dental technology.1. **Ethical Professional Practice:**

Aligns with Program Outcome on Ethical Practice: Reinforces the program’s emphasis on ethical considerations and professional conduct, aligning with the goal of instilling high ethical standards in future dental technicians.1. **Collaboration and Communication:**

Aligns with Program Outcome on Teamwork and Communication: Supports the program’s aim of preparing students to work effectively within interdisciplinary dental care teams, emphasizing the importance of communication skills in professional settings.1. **Critical Assessment of Dental Prostheses:**

Aligns with Program Outcome on Quality Control: Contributes to the program’s objective of ensuring students can critically evaluate the quality of dental restorations, applying quality control measures in line with industry standards.1. **Efficient Laboratory Management:**

Aligns with Program Outcome on Management and Organization: Enhances the program’s goal of equipping students with the skills needed to efficiently manage dental laboratory operations, including resource management and workflow organization.* + By achieving the learning outcomes in the "Intro in Digital Dentistry" course, students make significant progress toward meeting the broader learning outcomes of the Dental Technician program. This course plays a crucial role in preparing students for the demands of the profession, ensuring they possess the knowledge, skills, and professional attributes necessary for success in the field of dental technology. The alignment of course learning outcomes with program learning outcomes ensures a cohesive and comprehensive educational experience that supports students' academic and professional development.
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| **Course Content** | **Course Plan** | **Week** |
| Introduction to digital dentistry. The history of digital dentistry | 1 |
| Concepts in digital dentistry, digital photography, digital radiography and digital spectrophotometry | 2 |
| Familiarity with the equipment and work environment in digital dentistry | 3 |
| Scanning of working models and Digital impression | 4 |
| Digital Stereophotogrammetry technology | 5 |
| Systems for digital registration of jaw movements | 6 |
| Facial scanner | 7 |
| CBCT technology | 8 |
| CAD technology in restorative dentistry. Digital Smile Design technology and virtual tools in CAD software | 9 |
| Current softwares in CAD-CAM technology | 10 |
| Fabrication of dental restorations using digital technology: techniques and materials. laboratory production and chairside production of restorations | 11 |
| 3d printers in dentistry. Familiarity with methods and materials, advantages and disadvantages | 12 |
| Laser fusion technology, familiarity with the working principle and use in dentistry | 13 |
|  | 14 |
| Final assessment | 15 |
|  | **Weekly plan – Laboaratory exercises** | **Week** |
| Introduction to digital dentistry. Familiarity with equipment and work environment | 1 |
| System Set-Up and configuration | 2 |
| Administration phase | 3 |
| Extraoral scanning of models | 4 |
| Intraoral scanning – digital impression | 5 |
| Model phase | 6 |
| Restoration Design and Manufacturing | 7 |
| Case study and Troubleshooting | 8 |
| Mastering Single Tooth Restorations | 9 |
| Design of crown and prosthetic bridge with partial anatomy | 10 |
| Design of crown and prosthetic bridge with full anatomy | 11 |
| Implant Restorations | 12 |
| Additional Functions: Surgical Guide, Smile Design and Virtual Articulator | 13 |
| **Teaching/****Learning****Methods** | **Teaching/Learning Activity – Weights (%)** |
| **1. Lectures: 15%*** + Purpose: To introduce key concepts, models, and theories in knowledge management in healthcare.
	+ Relevant for: Building foundational understanding and providing a theoretical framework for the course.
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| **2. Case Studies and Analysis: 25%*** + Purpose: To apply theoretical knowledge to practical, real-world healthcare scenarios.
	+ Relevant for: Critically evaluating the effectiveness of knowledge management in different contexts and reflecting on practical examples.
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| **3. Group Discussions and Seminars: 20%*** + Purpose: To encourage interactive learning, exchange of ideas, and development of critical thinking.
	+ Relevant for: Discussing various models and theories in depth and reflecting on their application in healthcare.
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| **4. Project Work**:**20%*** + Purpose: To foster creativity, practical skill application, and collaborative learning.
	+ Relevant for: Developing new and creative ways of managing knowledge in healthcare contexts and identifying barriers and facilitators to knowledge management.
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| **5. Research Assignments and Papers**: **10%*** + Purpose: To enhance research skills and the ability to critically analyse information.
	+ Relevant for: In-depth study of specific topics within knowledge management, enhancing understanding through research.
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| **6. Guest Lectures and Workshops**: **10%*** + Purpose: To provide exposure to industry experts and practical insights.
	+ Relevant for: Gaining different perspectives on knowledge management practices and challenges in healthcare.
 |
| **Total** | **100 %** |
| **Assessment****Methods** | **Assessment Activity – Weights (%)** |
| **1. Written Examinations: (20%)*** + Purpose: To assess understanding of key concepts, theories, and frameworks in knowledge management.
	+ Relevant for: Evaluating foundational knowledge and the ability to recall and explain core principles.
 |
| **2. Case Study Analysis: (25%)*** + Purpose: To assess the application of theoretical knowledge to real-world healthcare scenarios.
	+ Relevant for: Demonstrating critical thinking and problem-solving skills by analysing and suggesting solutions for knowledge management issues in healthcare.
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| **3. Group Projects and Presentations: (20%)*** + Purpose: To assess collaborative skills, application of knowledge, and presentation abilities.
	+ Relevant for: Evaluating the development of practical approaches to knowledge management and the ability to work effectively in teams.
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| **4. Research Paper or Assignment: (15%)*** + Purpose: To assess in-depth research skills and critical analysis.
	+ Relevant for: Allowing students to conduct detailed investigations into specific areas of knowledge management, demonstrating their ability to engage with complex material.
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| **5. Reflective Journals or Logs: (10%)*** + Purpose: To assess personal reflection and self-awareness.
	+ Relevant for: Encouraging students to reflect on their learning journey, the challenges they faced, and how they applied their knowledge in different contexts.
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| **6. Class Participation and Discussions: (10%)*** + Purpose: To assess engagement, understanding of course material, and ability to contribute thoughtfully to discussions.
	+ Relevant for: Gauging active participation and ability to articulate thoughts and ideas related to knowledge management in healthcare.
 |
| **Total** | **100%** |
| **Course Resources** | **Means** |
| **1. Textbooks and Academic Journals**:* + Purpose: Provide foundational knowledge and current research findings.
	+ Examples: Standard textbooks on knowledge management and healthcare management, peer-reviewed journals focusing on healthcare policy, management, and informatics.
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| **2. Case Studies**:* + Purpose: Illustrate practical applications of theories in real-world scenarios.
	+ Examples: Case studies from healthcare organizations showcasing successful knowledge management practices or challenges faced.
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| **3. Online Databases and Research Articles**:* + Purpose: Offer access to a wide range of academic research and industry reports.
	+ Examples: Access to databases like PubMed, JSTOR, and industry-specific repositories that contain research papers and reports on knowledge management in healthcare.
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| **4. E-Learning Platforms and MOOCs**:* + Purpose: Provide supplementary learning materials and courses.
	+ Examples: Online courses and lectures from platforms like Coursera, edX, or Khan Academy that cover relevant topics.
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| **5. Software and Technology Tools**:* + Purpose: Familiarize students with tools used in knowledge management.
	+ Examples: Introduction to software like electronic health records systems, data analysis tools (e.g., SPSS, Tableau), and collaborative platforms.
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| **6. Guest Lectures and Workshops**:* + Purpose: Provide expert insights and practical perspectives.
	+ Examples: Inviting healthcare professionals, knowledge management experts, and academics to speak or conduct workshops.
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| **7. Interactive Discussion Forums**:* + Purpose: Facilitate peer-to-peer learning and discussion.
	+ Examples: Online forums or platforms like Slack or Microsoft Teams where students can discuss course materials and share ideas.
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| **8. Group Project Resources**:* + Purpose: Support collaborative learning and practical application of concepts.
	+ Examples: Access to collaborative tools (like Google Workspace), guidelines for project development, and assessment criteria.
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| **9. Simulation Tools and Role-Playing Activities**:* + Purpose: Enable experiential learning in a controlled environment.
	+ Examples: Simulations of healthcare scenarios where knowledge management plays a key role, role-playing exercises to practice decision-making and strategy development.
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| **10. Library Resources**:* + Purpose: Offer a broad range of additional reading materials.
	+ Examples: Access to physical and digital libraries with books, dissertations, and theses on healthcare management and knowledge management.
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| **ECTS Workload** | **Activity type** |  |  |
| 1. Lectures
 | 30 h | 15.0 % |
| 1. Case study Analysis
 | 50 h | 25.0 % |
| 1. Group Discussions and Seminars
 | 40 h | 20.0 % |
| 1. Project Work
 | 40 h | 20.0 % |
| 1. Research Paper or Assignment
 | 20 h | 10.0 % |
| 1. Guest Lectures and Workshops
 | 20 h | 10.0 % |
| **Total** | **200 h** | **100.0 %** |
| **Literature** | 1. Clinical Applications of Digital Dental Technology. Radi Masri, Carl Driscoll. WILEY Blackwell 2015
2. DIGITAL RESTORATIVE DENTISTRY. Faleh Tamimi and Hiroshi Hirayama. Springer 2019
3. FUNDAMENTALS OF CAD/CAM DENTISTRY. Jonathan L.Ferencz and Nelson R.F.A Silva. American College of Prosthodontists 2018
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| **Contact** |  |

**Pre-requirements for the course**

This course does not have any pre-requirements.

**Assessment of Competence**

For the class to reach a master’s level of learning, students must prepare by reading the given material, complete all assignments for each class.Students will be evaluated for participation as:

* Full participation in class activities and group work.
* Participation in class discussions (without dominating the conversation).
* Demonstrating understanding of the content of the material read.
* Providing critical thinking about the subject matter.
* Adding ideas to class discussion.
* Helping others clarify an idea.
* Supporting others as they share their ideas and speak in class.
* Raising new ideas and questions.
* Arriving on time and staying throughout the lesson.

**Participation policy**

Students are expected to attend all lectures and exercises.The importance of class attendance is reflected in the percentage of the grade associated with attendance.You cannot receive attendance grades if you are not in class.If you have an emergency and cannot attend class, please email me in advance to let me know.Class will start on time to honor everyone's commitment.If you are late, please enter the classroom quietly.Participation marks will be deducted for lateness.

**Students must be present at least 80% of the activities.**

**Rules and Regulations**

**Attendance**

UBT College undertakes the responsibility of training future professionals to the highest standards.One of these standards is taking responsibility for personal actions.If a student misses a particular session, the student has lost that instruction forever.They can never be repeated.When a student is late to class, the entire class is interrupted.Such interruptions will not be tolerated.Students have a responsibility and a contract to stay in class for the duration of the sessions, for each day.Students who leave sessions early, even if they leave with permission, cause disciplinary problems that will not be tolerated.

You made a contract with the UBTs to be in class and attentive throughout the learning process.Every student must be in every session, every day that is scheduled, throughout the semester.

All teaching sessions begin at their designated times in the lesson timetable. All sessions start and end at designated times in the class schedule.Any student who leaves the class session early will be considered absent.

**Electronic Devices**

It is distracting to everyone in the classroom when cell phones ring during class.This is even worse if it happens during a test or quiz.Since this is a classroom and not a room for listening and/or viewing electronic devices such as smart phones, personal laptops and/or other electronic devices will not be allowed.

The classroom will be a cell phone free zone.If you must bring a cell phone to class, it must be turned off or set to vibrate.It is distracting for a classroom to have students constantly answering cell phones during class.If you absolutely must answer the call, leave the classroom.A student who accepts calls during class will be asked to leave class.Hearing devices will not be allowed in the classroom for any reason.

**Tests And Quizzes**

Tests and quizzes are usually scheduled at the beginning of the lesson.Tests and quizzes are one-way teachers measure a student's knowledge.Failure to participate in tests or quizzes interferes with this process.UBT College does not reward students who do not take their tests or quizzes on time;therefore, the teacher cannot allow students to take tests or quizzes after the deadline.

Tests and quizzes must be taken by each student, any student who asks for help or helps other students during a test or quiz will be removed from the test and will be graded zero for that test or quiz.It is the student's responsibility to prepare for tests and quizzes at all times.It is the student's responsibility to know when there are tests or quizzes to take.

**Seminarsand Projects**

Seminars and projects must be done on the student's own time, not during class.

Never allow another student to copy your seminars and projects.

Never copy another student's seminars and projects.

**Due Dates**

One thing all professionals must learn is to be on time.Excuses do not make the student and teacher feel better about their wasted time.For all assigned tasks, sufficient time is given to complete, and all work must be completed in the time set by the teacher.**No delay in the completion of the works will be accepted**.

**Proper Attire**

Professionals must dress appropriately. Any student who does not dress appropriately during class time will not be allowed to participate in class activities.

**Conduct**

Students at UBT College must learn to work in groups, regardless of group composition.Tolerance, courtesy, respect, and a peaceful environment are required in the classroom.

All students are expected to be respectful to other students and to the teacher during class and in dealing with class matters.Disrespectful behavior will affect your participation grade.Examples of respectful behavior in the classroom include, but are not limited to:

* Listening to each other and exchanging ideas.
* Arrival and departure according to the class schedule, except in cases of emergency.
* Turn off the cell phone ringer and do not receive calls in class.
* Speak so that others can hear and understand what you are saying.
* Engaging in class discussion (avoiding side conversations during class and dominating class discussion).
* Listening (not speaking) when the teacher or other students are addressing the class.
* Working collaboratively with a specific or selected group.
* Completion of class work on time.
* Focusing on class topics and not on personal matters or work unrelated to the class.
* Viewing your computer and/or cell phone only when related to class work.
* Raising questions when there is no clarification about the work in class.

**Academic Dishonesty**

Violations of Academic Integrity include, but are not limited to, the following actions:

* Cheating on an exam.
* Plagiarism.
* Working together on an individual assignment, paper, or project when the instructor has specifically stated students should not do so.
* Submitting the same term paper to more than one instructor or allowing another individual to assume one’s identity for the purpose of enhancing one’s grade.