



Development and Implementation of MDTV Curricula (DIMTV)

WP 2.3 - Activity 2.3.6 Report

Preparing teaching materials and instructions

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1. Introduction

In the scope of Work Package 2.3, the partner institutions have prepared several learning modules to innovate their curricula, follow the trends, and demand in the labor market. This document includes the teaching and learning materials list, used in these learning modules.

The presentation of teaching and learning materials is organized in individual partner sections.



2. Development of teaching and learning materials per partner institution

2.1 Epoka University

Epoka University is a private Higher Education Institution in Albania that has a bachelor and master's degree in “*Electronics and digital communication engineering*” and “*Computer Engineering*”. To meet expectations requirements of the labor market in Albania for higher qualified experts in the field of Multimedia and Digital Television, Epoka University has introduced an image processing module for bachelor and master, in both two study programs, following Erasmus+ project “*Development And Implementation Of Multimedia and Digital Television Curricula (DIMTV)*”.

Through this project, Epoka University has innovated its actual master and bachelor curricula by developing and implementing specialized modules.

All the materials used for the three courses offered are available for the students online at www.lms.epoka.edu.al where they can enter and download them at any time. The courses include homework, projects, assignments, presentations by the students, and midterm and final exams for evaluation. The book and lecture notes are distributed to all the students and the syllabus is in line with the top universities of the world, following best practices. The materials are available for review at the partner institution.

Digital Image Processing, due to the COVID-19 situation, is currently offered online in live streaming which is also registered and shared with the students.

Table 1. List of books to be purchased for Epoka University

| No. | List of ICT/DIMTV books to support bachelor and master curriculum | Copies |
|-----|---|--------|
| 1 | Unity Virtual Reality Projects: Explore the world of virtual reality by building immersive and fun VR projects using Unity 3D | 4 |
| 2 | Digital Image Processing (4th Edition) | 3 |
| 3 | Learning OpenCV 3: Computer Vision in C++ with the OpenCV Library | 4 |
| 4 | Introduction to Fourier Optics | 3 |
| 5 | Engineering Optics With Matlab ^o | 3 |
| 6 | Learning Processing: A Beginner's Guide to Programming Images, Animation, and Interaction (The Morgan Kaufmann Series in Computer Graphics) | 3 |
| 7 | Computer Graphics: Principles and Practice | 3 |

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|----|---|---|
| 8 | The Image Processing Handbook, | 4 |
| 9 | Modern Assembly Language Programming with the ARM Processor | 3 |
| 10 | FPGA-Based Embedded System Developer's Guide | 3 |
| 11 | FPGA-based Implementation of Signal Processing Systems | 3 |
| 12 | Dynamic Mode Decomposition: Data-Driven Modeling of Complex Systems | 3 |
| 13 | Data-Driven Science and Engineering: Machine Learning, Dynamical Systems, and Control | 3 |
| 14 | Digital Design Global Edition | 3 |
| 15 | Biomedical Information Technology 2 nd Edition | 3 |
| 16 | Deep Learning for Medical Image Analysis, 1st Edition | 3 |
| 17 | Unsupervised Learning in Space and Time | 3 |
| 18 | Hyperspectral Image Analysis | 3 |
| 19 | Project Management: A Systems Approach to Planning, Scheduling, and Controlling | 1 |
| 20 | Managing innovation (6th edition) | 1 |

2.2 UAMD University

Aleksandër Moisiu University, Durrës is the only public institution of higher education that offers studies at the Bachelor level in the field of multimedia technologies and digital television. This Bachelor study program was opened in 2012 as a result of the TEMPUS RICUM project. The “*Multimedia and Digital Television*” program is unique in Albania and the only one that can provide human resources to fulfill market needs and will influence the increase of the number of experts and professionals in this field and also increase the quality of production media.

The Faculty of Information Technology, Department of Information Technology following Erasmus+ project Development And Implementation Of Multimedia and Digital Television Curricula (DIMTV) started the procedures in the academic year 2017-2018, to open the Professional Master program in collaboration with seven other national institutions and with three specific directions such as:

- 3D Animation
- Image Processing
- Production and post-production

All courses in curricula are taught using contemporary teaching methods, such as problem-based learning, game-based learning, case study method, etc. Courses are organized using the blended learning concept – a combination of traditional and e-learning concepts. To enable efficient and effective teaching and learning, a multimedia lab as a recording studio is equipped with modern hardware and software tools for producing and editing.

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Based on the national technology development strategies, AMU Strategy Development Planning, and increasing the high rate of ICT penetration in teaching, the implementation of virtual teaching, gaming and e-learning are becoming more and more urgent. These alternative methods aim to increase equal education opportunities, giving students more flexibility to combine teaching with work, family, and community, the quality of the content of didactic teaching materials which are increasingly available online.

All course materials and activities are available to students. Teaching materials are prepared in line with European, national and institutional standards and practices. They are prepared in the form of printed lecture notes and electronic materials (presentations, teaching notes, etc.). For some specific topics, instructions for teaching and practices will be prepared in the form of video tutorials for students.

Currently, the teaching materials are printed and kept at the Department of Information Technology, they are not published online. The list of the books planned to be purchased for teaching purposes are as follows:

Table 2 List of books to be purchased for UAMD

| No. | Title | Author | Publishing House | Year |
|-----|---|---|------------------|------|
| 1 | Mathematics for Multimedia | Mladen Victor Wickerhauser | Birkhäuser | 2010 |
| 2 | Mathematics for 3D Game Programming and Computer Graphics | Eric Lengyel | Cengage Learning | 2011 |
| 3 | The Filmmaker's Guide to Visual Effects: The Art and Techniques of VFX for Directors, Producers, Editors and Cinematographers | Eran Dinur | Routledge | 2017 |
| 4 | Stop Motion: Craft Skills for Model Animation, 3rd Edition | Susannah Shaw | Routledge | 2017 |
| 5 | Visual Storytelling: Videography and Post Production in the Digital Age | Ronald J. Osgood M. Joseph Hinshaw | Cengage Learning | 2013 |
| 6 | Digital Image Processing, 4th edition | Rafael C. Gonzalez | Pearson | 2018 |
| 7 | Advances in Biometrics: Modern Methods and Implementation Strategies | G.R. Sinha | Springer | 2019 |
| 8 | Complete Virtual Reality and Augmented Reality Development with Unity | Jesse Glover Jonathan Linowes | Packt Publishing | 2019 |
| 9 | Holography: Principles and Applications | Raymond K. Kostuk | CRC Press | 2019 |
| 10 | Creating Augmented and Virtual Realities | Erin Pangilinan Steve Lukas Vasanth Mohan | O'Reilly Media | 2019 |
| 11 | Computer Vision: Principles, Algorithms, Applications, Learning, 5th edition | E. R. Davies | Academic Press | 2017 |
| 12 | Signals and Systems using MATLAB, 3rd edition | Luis Chaparro Aydin Akan | Academic Press | 2018 |

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|----|---|---|-----------------------------|------|
| 13 | Stop Motion Filmmaking: The Complete Guide to Fabrication and Animation | Christopher Walsh | Bloomsbury Academic | 2019 |
| 14 | Learning Blender: A Hands-On Guide to Creating 3D Animated Characters; 2nd edition | Oliver Villar | Addison-Wesley Professional | 2017 |
| 15 | Blender 3D By Example: Design a complete workflow with Blender to create stunning 3D scenes and films step-by-step! | Romain Caudron, Pierre-Armand Nicq | Packt Publishing | 2015 |
| 16 | Maya Visual Effects The Innovator's Guide: Autodesk Official Press; 2nd edition | Eric Keller | Sybex | 2013 |
| 17 | MAXON Cinema 4D R20: Modeling Essentials | Pradeep Mamgain | Padexi Academy | 2018 |
| 18 | Immersive Sound: The Art and Science of Binaural and Multi-Channel Audio | Agnieszka Roginska Paul Geluso | Routledge | 2017 |
| 19 | Spatial Audio Reproduction with Primary Ambient Extraction | JianJun He | Springer Singapore | 2017 |
| 20 | Cinematography: Theory and Practice: Image Making for Cinematographers and Directors | Blain Brown | Routledge | 2016 |
| 21 | The Video Editing Handbook | Aaron Goold | Independently published | 2019 |
| 22 | Project Management: A Managerial Approach; 10 edition | Jack R. Meredith; Samuel J. Mantel Jr.; Scott M. Shafer | John Wiley & Sons | 2017 |
| 23 | Information Technology Project Management, 9th Edition | Kathy Schable | Cengage | 2019 |
| 24 | Adobe Audition CC Classroom in a Book, 2nd Edition | Maxim Jago | Adobe Press | 2018 |
| 25 | Unity for Absolute Beginners | Sue Blackman | Apress | 2014 |
| 26 | Electroacoustic Devices: Microphones and Loudspeakers | Glen Ballou | Focal Press | 2009 |
| 27 | Sound Reproduction: The Acoustics and Psychoacoustics of Loudspeakers and Rooms | Floyd Toole | Focal Press | 2008 |
| 28 | Handbook for Sound Engineers, 5th Edition | Glen Ballou | Routledge | 2015 |
| 29 | Television Production Handbook, 12th edition | Herbert Zettl | Wadsworth Publishing | 2014 |
| 30 | Light Science & Magic: An Introduction to Photographic Lighting; 5 edition | Fil Hunter; Steven Biver; Paul Fuqua | Routledge | 2015 |
| 31 | Digital Photography Masterclass: Advanced Photographic Techniques for Creating Perfect Pictures | Tom Ang | DK; Reprint edition | 2017 |
| 32 | Photoshop CC Essentials for Photographers | Tony Northrup; Chelsea Northrup | Mason Press | 2016 |
| 33 | Adobe Premiere Pro CC Classroom in a Book; 2nd edition | Maxim Jago | Adobe Press | 2019 |
| 34 | Adobe After Effects CC Classroom in a Book; 2nd edition | Lisa Fridsma; Brie Gyncild | Adobe Press | 2018 |
| 35 | A Practical Guide to Photography: Basic Techniques for Beginners and Beyond | Ian Middleton | Schmetterling Productions | 2018 |

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|----|--|--|----------------------------|------|
| 36 | Graphic Design School: The Principles and Practice of Graphic Design, 6th edition | David Dabner Sandra Stewart Abbie Vickress | Wiley | 2017 |
| 37 | The Beginner's Guide to DaVinci Resolve 16: Learn Editing, Color, Audio & Effects | Dion Scoppettuolo Paul Saccone | Blackmagic Design | 2019 |
| 38 | Computer Graphics: Implementation and Explanation | Jules Bloomenthal | Independently published | 2019 |
| 39 | Video Production 101: Delivering the Message | Antonio Manriquez Tom McCluskey | Peachpit Press | 2014 |
| 40 | The Animator's Survival Kit: A Manual of Methods, Principles, and Formulas for Classical, Computer, Games, Stop Motion and Internet Animators, 4th Edition | Richard Williams | Farrar, Straus and Giroux; | 2012 |

2.3 University of Prishtina (UP)

At the University of Prishtina UP they have modernized, revised, and updated the existing study programs by developing and integrating certain modules from the DIMTV field. Consequently, the following literature is foreseen and has been purchased for the updated (DiMTV) study programs.

Table 3 List of books to be purchased for UP

| No. | List of ICT/DIMTV books to support bachelor and master curriculum |
|-----|--|
| 1 | Manolakis D. G., Ingle V. K., "Applied Digital Signal Processing: Theory and Practice", Cambridge University Press, New York, 2011 |
| 2 | Kurose, J. F., & Ross, K. W. (7th Edition) (2016). Computer networking: a top-down approach. |
| 3 | Travis F. Collins, Robin Getz, Di Pu, and Alexander M. Wyglinski; "Software-Defined Radio for Engineers" Artech House, ISBN-13: 978-1-63081-457-1, 2018 |
| 4 | T Roupael. "Rf and Digital Signal Processing for Software Defined Radio" Elsevier 2009 |
| 5 | Michel C. Jeruchim, Philip Balaban, K. Sam Shanmugan, "Simulation and Software Radio for Mobile Communications", ISBN: 1580530443, Artech House (Fitchburg, MA, USA), 2002. |
| 6 | Essential skills for 3D modeling, rendering, and animation. NB. Zeman |
| 7 | Lightning Fast Animation in Element 3D: Master the intricacies of Element 3D, the fast rendering Adobe After Effects plugin. Ty Audronis, Packt Publishing, 2014. ISBN: 978-1-78355-938-1. |
| 8 | Andreas F Molisch, "Wireless Communications" - Wiley - IEEE, 2nd Edition, © 2011 John Wiley & Sons Ltd. |
| 9 | Digital Image Processing: Practical Approach. B. Furht, E. Akar, A. Andrews, Springer 2018, ISBN: 3319966332, 9783319966335 |
| 10 | Computer Vision, Pattern Recognition, Image Processing, and Graphics. R. Rameshan, C. Arora, SD. Roy, Springer Singapore 2018, ISBN: 978-981-13-0019-6, 978-981-13-0020-2 |
| 11 | Mastering Autodesk Maya 2016: Autodesk Official Press. T. Palamar, Sybex 2015. ISBN-10: 1119059828, ISBN-13: 978-1119059820. |
| 12 | Samuel J. Mantel Jr., Jack R. Meredith, Scott M. Shafer "Project Management: A Strategic Managerial Approach," Wiley; 10 th edition, Dec. 2017, ISBN-13: 978-1119369097. |
| 13 | David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton, Jerome Henry (2017.), IoT Fundamentals, Cisco Press |

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| 14 | Setoodeh P., Haykin S., "Fundamentals of Cognitive Radio". John Wiley & Sons, Inc., 2017. |
| 15 | R. Steinmetz and K. Nahrstedt, Media Coding and Content Processing, Prentice Hall, 2002, |
| 16 | Behrouz A. Forouzan (2012). Data Communications and Networking, Mc Graw Hill |
| 17 | Janevski, T. (2015). Internet Technologies for Fixed and Mobile Networks. Artech House. |
| 18 | Tanenbaum, A.S., Wetherall, D.J. (2011). Computer Networks, 5th, 2011. Pearson Education, Inc. |
| 19 | S. Chapra (2019): Essential MATLAB for Engineers and Scientists, 7th Edition, Publishing House "Elsevier", USA. |
| 20 | Labview for everyone. J. Travis, J. Kring, 2007. Prentice-Hall |
| 21 | Ralph F. Grove Ph.D., Web Based Application Development, ISBN-13: 9780763759407, 2010 |
| 22 | Rabin, S. (2010). Introduction to Game Development, 2nd ed. Boston, MA: Charles River Media. |
| 23 | James Aweya, Switch/Router Architectures: Systems with Crossbar Switch Fabrics 1st Edition 2020 |
| 24 | C. Sommer, F. Dressler, Vehicular Networking, Cambridge University Press, 2015. |
| 25 | Millimeter-Wave Wireless Communications, Theodore S. Rappaport, Robert W. Heath Jr., Robert C. Daniels, Prentice Hall, 2015 |
| 26 | 5G Mobile and Wireless Communications Technology, Afif Osseiran, Jose F. Monserrat, Patrick Marsch - Cambridge University Press 2016 |
| 27 | Pahlavan, Kaveh, and Prashant Krishnamurthy. Principles of wireless access and localization. John Wiley & Sons, 2013. |
| 28 | Mavromoustakis, Constandinos X., George Mastorakis, and Jordi Mongay Batalla, eds. Internet of Things (IoT) in 5G mobile technologies. Vol. 8. Springer, 2016. |

2.4 University for Business and Technology (UBT)

UBT incorporated the courses related to multimedia into their study programs at their Faculties and study programs (Media communication, Digital art, and media, Computer science and engineering, Mechatronics management).