



ΕΦΗΜΕΡΙΔΑ ΤΗΣ ΚΥΒΕΡΝΗΣΕΩΣ ΤΗΣ ΕΛΛΗΝΙΚΗΣ ΔΗΜΟΚΡΑΤΙΑΣ

4 Ιουλίου 2025

ΤΕΥΧΟΣ ΔΕΥΤΕΡΟ

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ΑΠΟΦΑΣΕΙΣ

Αριθμ. ΔΠΘ/ΑΔΥΚΔ/ΣΥΓΚ/60687/6048/1289

Έγκριση τροποποίησης του Προγράμματος Μεταπτυχιακών Σπουδών με τίτλο «Τεχνολογίες Εμβύθισης - Καινοτομία στην Εκπαίδευση την Επιμόρφωση και το Σχεδιασμό Παιχνιδιών» του Τμήματος Πληροφορικής της Σχολής Θετικών Επιστημών του Δημοκρίτειου Πανεπιστημίου Θράκης.

Η ΣΥΓΚΛΗΤΟΣ ΤΟΥ ΔΗΜΟΚΡΙΤΕΙΟΥ
ΠΑΝΕΠΙΣΤΗΜΙΟΥ ΘΡΑΚΗΣ

Έχοντας υπόψη:

1. Το ν.δ. 87/1973 «Περί ιδρύσεως Πανεπιστημίων εις Θράκην και εις Κρήτην» (Α' 159).

2. Το π.δ. 86/2013 «Συγχώνευση Τμημάτων, ίδρυση - συγκρότηση - ανασυγκρότηση Σχολών στο Δημοκρίτειο Πανεπιστήμιο Θράκης» (Α' 124).

3. Τον ν. 5094/2024 «Ενίσχυση του Δημόσιου Πανεπιστημίου - Πλαίσιο λειτουργίας μη κερδοσκοπικών παραρτημάτων ξένων πανεπιστημίων και άλλες διατάξεις» (Α' 39) και ιδίως το άρθρο 5 αυτού.

4. Τα άρθρα 76-78 του ν. 4727/2020 «Ψηφιακή Διακυβέρνηση (Ενσωμάτωση στην Ελληνική Νομοθεσία της Οδηγίας (ΕΕ) 2016/2102 και της Οδηγίας (ΕΕ) 2019/1024) - Ηλεκτρονικές Επικοινωνίες (Ενσωμάτωση στο Ελληνικό Δίκαιο της Οδηγίας (ΕΕ) 2018/1972) και άλλες διατάξεις» (Α' 184).

5. Την παρ. 4 του άρθρου 16 του ν. 4957/2022 «Νέοι Ορίζοντες στα Ανώτατα Εκπαιδευτικά Ιδρύματα: Ενίσχυση της ποιότητας, της λειτουργικότητας και της σύνδεσης των Α.Ε.Ι. με την κοινωνία και λοιπές διατάξεις» (Α' 141).

6. Τον ν. 4957/2022 (Α' 141) και ιδίως τα άρθρα 79 «Επιτροπή μεταπτυχιακών σπουδών», 80 «Διαδικασία ίδρυσης Προγραμμάτων Μεταπτυχιακών Σπουδών», 81 «Όργανα διοίκησης ΠΜΣ-Σύνθεση», 82 «Αρμοδιότητες Οργάνων ΠΜΣ», 83 «Διδάσκοντες ΠΜΣ», 84 «Πόροι ΠΜΣ - Οικονομική διαχείριση», 85 «Οικονομική συνεργασία ΠΜΣ του Ανώτατου Εκπαιδευτικού Ιδρύματος», 86 «Δικαίωμα δωρεάν φοίτησης σε ΠΜΣ με τέλη φοίτησης - Υποτροφίες», 87 «Περιοδική αξιολόγηση των ΠΜΣ του ιδίου Τμήματος», 88 «Λοιπές διατάξεις για ΠΜΣ», 89 «Επαγγελματικά ΠΜΣ» καθώς και τις μεταβατικές διατάξεις του άρθρου 455.

7. Τον ν. 3374/2005 «Διασφάλιση της ποιότητας στην ανώτατη εκπαίδευση. Σύστημα μεταφοράς και συσσώρευσης πιστωτικών μονάδων - Παράρτημα Διπλώματος» (Α' 189).

8. Την υπό στοιχεία 135557/Ζ1/01.11.2022 εγκύκλιο του Υπουργείου Παιδείας και Θρησκευμάτων.

9. Την υπό στοιχεία ΔΠΘ/ΣΥΓΚ/30367/1842/22.02.2024 απόφαση της Συγκλήτου του Δημοκρίτειου Πανεπιστημίου Θράκης (Δ.Π.Θ.) «Έγκριση Εσωτερικού Κανονισμού λειτουργίας της Μονάδας Διασφάλισης Ποιότητας (ΜΟ.ΔΙ.Π.) του Δημοκρίτειου Πανεπιστημίου Θράκης» (Β' 1475).

10. Την υπό στοιχεία ΔΠΘ/ΑΔΥΚΔ/ΣΥΓΚ/65361/6062/1329/28.08.2024 (ΔΠΘ/ΜΟΔΙΠ/65443/801/28.08.2024) απόφαση της Συγκλήτου του Δ.Π.Θ. «Συγκρότηση της Επιτροπής Διασφάλισης Ποιότητας του Δ.Π.Θ.».

11. Την υπό στοιχεία ΔΠΘ/ΤΟ/60142/1975/13.05.2025 (ΔΠΘ/ΑΔΥΚΔ/ΣΥΓΚ/60687/6048/1289/13.05.2025) ανακοινωμένη απόφαση της Συνέλευσης του Τμήματος Πληροφορικής της Σχολής Θετικών Επιστημών του Δ.Π.Θ., που αφορά στην τροποποίηση του Προγράμματος Μεταπτυχιακών Σπουδών με τίτλο «Τεχνολογίες Εμβύθισης - Καινοτομία στην Εκπαίδευση την Επιμόρφωση και το Σχεδιασμό Παιχνιδιών» του Τμήματος.

12. Την υπό στοιχεία ΔΠΘ/ΜΟΔΙΠ/60946/857/15.05.2025 (ΔΠΘ/ΤΟ/60947/2011/15.05.2025) απόφαση της Μονάδας Διασφάλισης Ποιότητας (ΜΟ.ΔΙ.Π.) του Δ.Π.Θ.

13. Το υπό στοιχεία ΔΠΘ/ΤΟ/59715/1945/09.05.2025 πρακτικό της Συντονιστικής Επιτροπής του Προγράμματος Μεταπτυχιακών Σπουδών (Π.Μ.Σ.) «Τεχνολογίες Εμβύθισης - Καινοτομία στην Εκπαίδευση, την Επιμόρφωση και το σχεδιασμό Παιχνιδιών».

14. Την υπό στοιχεία ΔΦ 15/17338/30.10.2020 (Β' 4976) απόφαση της Διοικούσας Επιτροπής του Διεθνούς Πανεπιστημίου της Ελλάδος (υπ' αρ. 19/17.06.2020 συν.), που αφορά στην ίδρυση του Προγράμματος Μεταπτυχιακών Σπουδών με τίτλο «"Immersive Technologies-Innovation in Education, Training and Game Design (IMT)"», Τεχνολογίες Εμβύθισης - Καινοτομία στην Εκπαίδευση, την Επιμόρφωση και το σχεδιασμό Παιχνιδιών» του Τμήματος Πληροφορικής της Σχολής Θετικών Επιστημών του Διεθνούς Πανεπιστημίου της Ελλάδος.

15. Την υπό στοιχεία ΔΠΘ/ΔΔΚ/25927/2643/03.01.2023 διαπιστωτική πράξη εκλογής Πρύτανη και ορισμού τεσσάρων (4) Αντιπρυτάνεων του Δ.Π.Θ. (Υ.Ο.Δ.Δ. 4).

16. Την υπό στοιχεία ΔΠΘ/ΠΡ/27669/1883/18.01.2023 (Β' 267) πράξη του Πρύτανη του Δ.Π.Θ. που αφορά στον καθορισμό του τομέα ευθύνης και των επιμέρους αρμοδιοτήτων των τεσσάρων (4) Αντιπρυτάνεων του Δημοκριτείου Πανεπιστημίου Θράκης και της σειράς αναπλήρωσης Πρύτανη, σύμφωνα με την παρ. 2 του άρθρου 15 του ν. 4957/2022 (Α' 141).

17. Την υπό στοιχεία ΔΠΘ/ΑΔΥΚΔ/ΣΥΓΚ/34656/3306/708/14.01.2025 πράξη του Πρύτανη του Δ.Π.Θ. περί ανασυγκρότησης της Συγκλήτου του Δημοκριτείου Πανεπιστημίου Θράκης για το ακαδημαϊκό έτος 2024-2025.

18. Το γεγονός ότι οι διατάξεις της παρούσας δεν αφορούν σε διοικητική διαδικασία για την οποία υπάρχει υποχρέωση καταχώρισης στο ΕΜΔΔ-ΜΙΤΟΣ.

19. Το γεγονός ότι από τις διατάξεις της παρούσας απόφασης δεν προκαλείται δαπάνη σε βάρος του τακτικού προϋπολογισμού του ιδρύματος ή του κρατικού προϋπολογισμού, αποφάσισε:

Να εγκρίνει την τροποποίηση των άρθρων 4 και 5 του Προγράμματος Μεταπτυχιακών Σπουδών με τίτλο, «“Immersive Technologies-Innovation in Education, Training and Game Design (IMT)”, Τεχνολογίες Εμβύθισης - Καινοτομία στην Εκπαίδευση, την Επιμόρφωση και το Σχεδιασμό Παιχνιδιών» του Τμήματος Πληροφορικής του Δ.Π.Θ., ως εξής:

4. Φοίτηση - χρονική διάρκεια για τη χορήγηση των τίτλων

Η χρονική διάρκεια για την απονομή του Μεταπτυχιακού Διπλώματος Ειδίκευσης (Μ.Δ.Ε.) καθορίζεται ανάλογα με το σενάριο φοίτησης των εκπαιδευομένων το οποίο περιλαμβάνει τις ακόλουθες επιλογές:

- Στο σενάριο πλήρους φοίτησης (full time) ορίζεται κατ'ελάχιστο σε δύο (2) εξάμηνα σπουδών και στη θερινή περίοδο (εντατικό πρόγραμμα) (75 ECTS), στα οποία περιλαμβάνεται και ο χρόνος για την τυχόν εκπόνηση και υποβολή προς κρίση της Μεταπτυχιακής Διπλωματικής Εργασίας (ΜΔΕ) ή ανεξάρτητης έρευνας (Independent Study - IS). (μέγιστος συνολικός χρόνος απόκτησης Μεταπτυχιακού τίτλου: 1 έτος).

- Στο σενάριο μερικής φοίτησης (part time) ορίζεται σε τέσσερα (4) εξάμηνα σπουδών και σε 2 θερινές περιόδους (εντατικό πρόγραμμα) (μέγιστος συνολικός χρόνος απόκτησης Μεταπτυχιακού τίτλου: 2 έτη).

Το μοντέλο φοίτησης του Π.Μ.Σ. είναι η Ασύγχρονη εξ Αποστάσεως Εκπαίδευση. Η διδασκαλία γίνεται κατά 75% σύγχρονη εξ αποστάσεως και 25% ασύγχρονη εξ αποστάσεως.

5. Μαθήματα, γλώσσα διδασκαλίας, διδακτική και ερευνητική απασχόληση των μεταπτυχιακών φοιτητών, πρακτικές ασκήσεις και πιστωτικές μονάδες

Το Π.Μ.Σ. συγκροτείται από τις ακόλουθες βασικές συνιστώσες:

1. Τα μεταπτυχιακά μαθήματα (δύο από τα μαθήματα επιλογής μπορεί να αντικαθίστανται από Ανεξάρτητη Έρευνα - Independent Study).

2. Τη Μεταπτυχιακή Εργασία.

5.1. Μεταπτυχιακά μαθήματα

Τα μαθήματα οργανώνονται σε δύο ενότητες: Υποχρεωτικά και Επιλογής.

Το σύνολο των πιστωτικών μονάδων του ΜΔΕ ορίζεται σε 75 ECTS.

Η Ανεξάρτητη Έρευνα Independent Study 15 ECTS.

MSc Thesis Project Part I (15 ECTS)

MSc Thesis Project Part II (15 ECTS).

Η Μεταπτυχιακή Εργασία (MSc Thesis Project Part I και MSc Thesis Project Part II) μπορεί να περιλαμβάνει τη μελέτη-επίλυση θεωρητικών ή πρακτικών προβλημάτων των επιστημονικών πεδίων που πραγματεύεται το ΠΜΣ. Η μεταπτυχιακή εργασία μπορεί να διεξάγεται ακόμη και σε συνδυασμό με πρακτική άσκηση σε πραγματικούς εργασιακούς χώρους, όπως βιομηχανίες, εργαστήρια, ερευνητικά κέντρα, επιχειρήσεις πληροφορικής, εκπαιδευτικούς χώρους (Φορείς Υποδοχής) κ.λπ. Σε κάθε περίπτωση, τόσο το θέμα όσο και ο χώρος-τρόπος εκπόνησης της μεταπτυχιακής εργασίας θα προϋποθέτει την έγγραφη έγκριση της Συντονιστικής Επιτροπής (ΣΕ) του ΠΜΣ αφού πρώτα ο Φορέας Υποδοχής υποβάλει γραπτώς έγγραφο περιγραφής ενός project που επιθυμεί να αναληφθεί ως μεταπτυχιακή εργασία. Στο σχετικό έγγραφο περιλαμβάνονται ο τίτλος του project, ο χώρος υλοποίησης, εάν είναι αμειβόμενο ή όχι, και το επιθυμητό αποτέλεσμα. Την τελική επιλογή του καταλληλότερου υποψηφίου για την ανάληψη του project, την έχει ο Φορέας Υποδοχής έπειτα από συνέντευξη όλων των ενδιαφερομένων (τύπου Career Day).

Η Ανεξάρτητη Έρευνα - Independent Study 15 ECTS, ακολουθεί τη φιλοσοφία υλοποίησης του Thesis Project και αποτελεί μια έρευνα μικρότερης κλίμακας. Ως επιβλέπων του Independent Study μπορεί να ορισθεί μόνο Ακαδημαϊκό Μέλος του Μεταπτυχιακού με την έγγραφη έγκριση της Συντονιστικής Επιτροπής.

Οι επιλογές φοίτησης για την ολοκλήρωση του Π.Μ.Σ. είναι οι ακόλουθες

Α Επιλογή (75 ECTS):

- Οκτώ (6) μαθήματα κορμού βαρύτητας 7,5 ECTS έκαστο (45 ECTS).

- Τέσσερα (4) επιλογής, βαρύτητας 7,5 ECTS έκαστο (30 ECTS).

(45 ECTS+30 ECTS)

Β Επιλογή (75 ECTS):

- Οκτώ (6) μαθήματα κορμού βαρύτητας 7,5 ECTS έκαστο (45 ECTS).

- Δύο μαθήματα (2) επιλογής, βαρύτητας 7,5 ECTS έκαστο (15 ECTS).

- Μία ανεξάρτητη έρευνα (Independent Study) βαρύτητας 15 ECTS.

(45 ECTS+15 ECTS+15 ECTS)

Γ Επιλογή (75 ECTS):

- Οκτώ (6) μαθήματα κορμού βαρύτητας 7,5 ECTS έκαστο (45 ECTS).

- MSc Thesis Project Part I βαρύτητας 15 ECTS (15 ECTS)

- MSc Thesis Project Part II βαρύτητας 15 ECTS (15 ECTS).

(45 ECTS+15 ECTS+ 15 ECTS)

Αναλυτικά το πρόγραμμα σπουδών έχει ως εξής:

ΜΕΤΑΠΤΥΧΙΑΚΑ ΜΑΘΗΜΑΤΑ

6 CORE Courses (7,5 ECTS- 187,5 Wh) έκαστο [1 ECTS~ 25Wh]

1. Fundamentals on Technology Enhanced Learning
 2. Fundamentals of Augmented Reality
 3. Immersive Software
 4. Security and privacy issues in Immersive Technologies
 5. Cross-Platform Game Development
 6. Immersive Systems IoT
 7. Fundamentals of Virtual Reality
 8. Immersive Technologies for Business Intelligence
- 4 ELECTIVE Courses (7.5)
- Immersive Story Telling
 - Immersive Experiences and Technologies
 - Digital Innovative Industries and Media Marketing
- (Past Core course)
- Immersive Media Design Courses
- Independent Study (15)
- MSc Thesis Project Part I (15)
- MSc Thesis Project Part II (15)

1ο Εξάμηνο (30 ECTS)

Υποχρεωτικά μαθήματα

Όλα τα μαθήματα του ΠΜΣ είναι ισοδύναμα και αντιστοιχούν σε επτά και μισή (7,5 ECTS) πιστωτικές μονάδες το καθένα.

a/a	Course Title	ECTS
IMTC1	Fundamentals on Technology Enhanced Learning	7,5
IMTC2	Fundamentals of Augmented Reality	7,5
IMTC3	Immersive Software	7,5
IMTC4	Security and privacy issues in Immersive Technologies	7,5

2ο Εξάμηνο (30 ECTS)

Υποχρεωτικά μαθήματα

a/a	Course Title	ECTS
IMTC5	Cross-Platform Game Development	7,5
IMTC7	Fundamentals of Virtual Reality	7,5

Μαθήματα επιλογής

a/a	Course Title	ECTS
IMTC6	Immersive Systems IoT	7,5
IMTC8	Immersive Technologies for Business Intelligence	7,5
MTP1	MSc Thesis Project Part I	15

Οι επιλογές φοίτησης:

- Συνδυασμός δύο υποχρεωτικών μαθημάτων (15 ECTS) και
- δύο μαθημάτων επιλογής (15 ECTS),
- εκπόνηση Μεταπτυχιακής Εργασίας Μέρος 1ο - MSc Thesis Project Part I (15 ECTS).

Θερινή Περίοδος (15 ECTS)

Μαθήματα Επιλογής

a/a	Course Title	ECTS
IMTE1	Immersive Story Telling	7,5
IMTE2	Immersive Experiences and Technologies	7,5
IMTE3	Digital Innovative Industries and Media Marketing	7,5
IMTE4	Immersive Media Design Courses	7,5
MTP2	MSc Thesis Project Part II	15
IS	Independent Study	15

Οι επιλογές φοίτησης:

- Συνδυασμός δύο μαθημάτων επιλογής (15 ECTS),
- Independent Study, (15 ECTS),
- εκπόνηση Μεταπτυχιακής Εργασίας Μέρος II - Thesis Project Part II (15 ECTS).

Σημειώνεται ότι το πρόγραμμα σπουδών μπορεί να εμπλουτίζεται από δράσεις τύπου επιστημονικών σεμιναρίων, όπου επιστήμονες που καλούνται από το εξωτερικό, μέλη ΔΕΠ, ερευνητικοί φορείς, εταιρίες, μεταπτυχιακοί φοιτητές του ΠΜΣ προβλέπεται να παρουσιάζουν επίκαιρους επιστημονικούς/ερευνητικούς προβληματισμούς σχετικά με το αντικείμενο του ΠΜΣ. Το Σεμινάριο αποσκοπεί ιδιαίτερα στην προώθηση του ακαδημαϊκού διαλόγου μέσα από διαλέξεις και επιστημονικές ημερίδες που θα δημιουργούν τις προϋποθέσεις για την ένταξη και συμμετοχή των μεταπτυχιακών φοιτητών/τριών στην ακαδημαϊκή κοινότητα.

Στην θεματική του εντάσσονται τα παρακάτω αντικείμενα:

(α) Η διεθνής επιστημονική επικαιρότητα (νέα δημοσιεύματα, αποτελέσματα ερευνών, νέες επιστημολογικές προσεγγίσεις),

(γ) κοινωνικά ζητήματα που απορρέουν από τη τρέχουσα επικαιρότητα/επιστημονική πρόοδος.

5.2 Μεταπτυχιακή εργασία

Η ΜΔΕ πραγματοποιείται μέσα από την δήλωση δύο ξεχωριστών μαθημάτων

(MTPI) MSc Thesis Project Part I (15 ECTS)

(MTPII) MSc Thesis Project Part II (15 ECTS)

Η Μεταπτυχιακή εργασία (Thesis Project), αποτελεί το επιστέγασμα των μεταπτυχιακών σπουδών του φοιτητή και την απόδειξη των γνώσεων και δεξιοτήτων που αποκόμισε από το Π.Μ.Σ.

Η ΜΕ μπορεί να είναι μια βιβλιογραφική ή εμπειρική ερευνητική μελέτη, ή ανάπτυξη κάποιας εφαρμογής/λογισμικού η οποία συγκροτείται με βάση συγκεκριμένο επιστημολογικό πλαίσιο, χρησιμοποιεί δόκιμες ερευνητικές μεθόδους και επιβλέπεται από διδάσκοντα του προγράμματος.

Όλες οι ΜΕ παρουσιάζονται δημόσια. Οι λεπτομέρειες σύνταξης, παράδοσης, παρουσίασης και αξιολόγησης της ΜΕ ορίζονται με απόφαση της Συντονιστικής Επιτροπής (ΣΕ).

Η Μεταπτυχιακή Εργασία υποστηρίζεται δημόσια ενώπιον τριμελούς εξεταστικής επιτροπής, που ορίζει η Συντονιστική Επιτροπή (ΣΕ) του ΠΜΣ και στην οποία συμμετέχουν ο επιβλέπων και δύο (2) άλλοι καθηγητές.

5.2α Ανεξάρτητη Έρευνα (Independent Study) (15 ECTS)

Η Ανεξάρτητη Έρευνα (Independent Study) αποτελεί μια μικρότερης κλίμακας Thesis Project, η οποία αποσκοπεί στη σε βάθος εξειδίκευση των γνώσεων και δεξιοτήτων ενός φοιτητή του ΠΜΣ σε συγκεκριμένη ερευνητική περιοχή.

Η Ανεξάρτητη Έρευνα μπορεί να είναι μια βιβλιογραφική ή εμπειρική ερευνητική μελέτη, ή ανάπτυξη κάποιας εφαρμογής/λογισμικού η οποία συγκροτείται με βάση συγκεκριμένο επιστημολογικό πλαίσιο, χρησιμοποιεί δόκιμες ερευνητικές μεθόδους και επιβλέπεται από διδάσκοντα του προγράμματος.

Η Ανεξάρτητη Έρευνα συνοδεύεται από γραπτό κείμενο.

Οι λεπτομέρειες σύνταξης, παράδοσης, παρουσίασης και αξιολόγησης της ΜΕ ορίζονται με απόφαση της Συντονιστικής Επιτροπής (ΣΕ).

5.3. Παρακολούθηση μαθημάτων

(α) Όλα τα Μαθήματα προϋποθέτουν τη στενή συνεργασία των μεταπτυχιακών φοιτητών με τον διδάσκοντα η οποία διασφαλίζεται με τη χρήση Ειδικής Εκπαιδευτικής Πλατφόρμας Ηλεκτρονικής Μάθησης (τύπου Moodle). Αναλόγως του εκπαιδευτικού σεναρίου της ενότητας αλλά και των εκπαιδευτικών αναγκών, δύναται να γίνει χρήση τεχνολογιών τηλεδιασκέψεων (τύπου Zoom) ή video on demand.

(β) Η παρακολούθηση του Επιστημονικού Σεμιναρίου είναι υποχρεωτική ή προαιρετική για τους φοιτητές που είναι εγγεγραμμένοι στο ΠΜΣ και ορίζεται από τον διδάσκοντα ο οποίος είναι υπεύθυνος για την οργάνωσή του, για την κατάρτιση του προγράμματος των ομιλητών και για τις ακαδημαϊκές υποχρεώσεις των εγγεγραμμένων φοιτητών καθώς και την αξιολόγηση αυτών. Σε κάθε περίπτωση, απαιτείται η σύμφωνη γνώμη της ΣΕ. Το πρόγραμμα σεμιναρίων θα πρέπει να κατατίθεται στην ΣΕ ένα μήνα πριν την έναρξη του ΠΜΣ.

5.4 Αξιολόγηση φοιτητών

Η αξιολόγηση της επίδοσης του φοιτητή γίνεται με ακέραιους και μισούς βαθμούς στην κλίμακα 0 (μηδέν) έως 10 (δέκα). Οι βαθμοί από 5 (πέντε) έως 10 (δέκα) θεωρείται ότι καλύπτουν τις απαιτήσεις του μαθήματος. Βαθμός χαμηλότερος του 5 (πέντε) σημαίνει ότι ο φοιτητής υποχρεούται είτε να επαναλάβει το αντίστοιχο μάθημα ή να επιλέξει άλλο στη θέση του (σε περίπτωση μαθήματος επιλογής).

Στη δεύτερη περίπτωση το μάθημα στο οποίο απέτυχε διαγράφεται από τον φάκελό του.

Επίσης, η ΜΕ και η Ανεξάρτητη Έρευνα, μπορεί να βαθμολογηθούν από τον Επιβλέποντα ή και την Επιτροπή Αξιολόγησης στην ίδια κλίμακα με ακέραια ή μισή μονάδα. Ο μέσος όρος βαθμολογίας που προκύπτει διαμορφώνεται σε αριθμό που μπορεί να περιέχει μέχρι και δύο δεκαδικά ψηφία.

5.5 Βαθμός Μεταπτυχιακού Διπλώματος Ειδίκευσης (ΜΔΕ)

Ο βαθμός του ΜΔΕ υπολογίζεται ως ακολούθως: Ο βαθμός ενός εκάστου των Μαθημάτων και Θεμάτων που παρακολούθησε επιτυχώς ο φοιτητής στα δύο έτη σπουδών του, καθώς και ο βαθμός της ΜΕ πολλαπλασιάζεται με τον αριθμό των πιστωτικών μονάδων που του αντιστοιχούν κατά το Πρόγραμμα Σπουδών. Το άθροισμα των επιμέρους γινομένων διαιρείται με το σύνολο των ECTS (90) και εξάγεται ο Βαθμός Διπλώματος, ο οποίος μπορεί να περιέχει μέχρι και δύο δεκαδικά ψηφία.

Ο βαθμός ΜΔΕ από 8.50 και άνω χαρακτηρίζεται ως «Άριστα».

Ο βαθμός ΜΔΕ από 6.50 έως 8.49 χαρακτηρίζεται ως «Λίαν Καλώς».

Ο βαθμός ΜΔΕ από 5.00 έως 6.49 χαρακτηρίζεται ως «Καλώς».

5.6 Παράταση και αναστολή φοίτησης Μεταπτυχιακός/ή φοιτητής/τρια που λόγω σημαντικού κωλύματος

δεν δύναται να παρακολουθήσει τα μαθήματα του Προγράμματος μπορεί με αίτησή του προς την ΣΕ να ζητήσει άδεια αναστολής της φοίτησής του για ένα εξάμηνο και αντίστοιχη παράταση των σπουδών του. Αναστολή φοίτησης μπορεί να δοθεί το πολύ για δύο εξάμηνα, συνεχόμενα ή μη.

Ομοίως μετά από τεκμηριωμένη αίτηση φοιτητή ή φοιτήτριας που προσυπογράφεται από τον Επιβλέποντα μπορεί να δοθεί παράταση ενός εξαμήνου για τη συμπλήρωση της ΜΕ. Η παράταση μπορεί να ανανεωθεί για ένα ακόμη εξάμηνο.

Μετά την συμπλήρωση δύο ημερολογιακών ετών από την πρώτη εγγραφή του/της φοιτητή/τριας (πλήρους φοίτησης) που δεν έχει συμπληρώσει τις ακαδημαϊκές του υποχρεώσεις και δεν έχει αποφοιτήσει από το ΠΜΣ διαγράφεται μετά από απόφαση της ΣΕ.

5.7 Γλώσσα Διδασκαλίας Αγγλική Γλώσσα.

5.8 Διδακτική και Ερευνητική Απασχόληση των Μεταπτυχιακών φοιτητών

Οι Μεταπτυχιακοί Φοιτητές θα μπορούν, ύστερα από απόφαση της Συνέλευσης Ειδικής Σύθεσης του Τμήματος και της Συντονιστικής Επιτροπής, να επικουρούν Καθηγητές του Τμήματος σε φροντιστηριακές ασκήσεις ή/και εργαστήρια του Προπτυχιακού Προγράμματος Σπουδών, καθώς και να συμμετέχουν σε ερευνητικά έργα και προγράμματα, σχετικά με το επιστημονικό τους αντικείμενο.

5.9 Έναρξη και κατάθεση αιτήσεων

Η έναρξη του προγράμματος θα πραγματοποιείται την 1η Οκτωβρίου κάθε ημερολογιακού έτους, ενώ η κατάθεση αιτήσεων θα γίνεται μέχρι την ημερομηνία που θα αποφασίζει η ΣΕ του ΠΜΣ.

Η κατάθεση αιτήσεων των Ανεξάρτητων Σπουδαστών μπορεί να γίνεται καθ' όλη τη διάρκεια του ημερολογιακού έτους μέχρι δύο μήνες πριν την έναρξή του κάθε εξαμήνου.

6. Αριθμός των μεταπτυχιακών φοιτητών, οι δυνατότητες και οι ανάγκες του Τμήματος σε προσωπικό και υλικοτεχνική υποδομή για την απρόσκοπτη λειτουργία του ΠΜΣ

6.1 Αριθμός των μεταπτυχιακών φοιτητών

Ο αριθμός φοιτητών ανά έτος στο πρόγραμμα ορίζεται σε εκατό (100) ως προς το ανώτατο όριο του.

Απαιτούμενα Δικαιολογητικά

- Αίτηση.
- Βιογραφικό Σημείωμα.
- Δύο (2) Συστατικές Επιστολές.
- Ακαδημαϊκοί Τίτλοι (Πτυχία, τυχόν εξειδικεύσεις κ.λπ.).

Η επιλογή των υποψηφίων γίνεται μετά από αξιολόγηση του φακέλου υποψηφιότητας από την ΣΕ για το εάν οι υποψήφιοι έχουν όλα τα απαιτούμενα δικαιολογητικά ώστε να συνεχίσουν σε περαιτέρω αξιολόγηση. Ελλιπείς φάκελοι θα απορρίπτονται.

Οι πλήρεις φάκελοι υποψηφιότητας θα αξιολογούνται με βάση:

1. Ακαδημαϊκά/ερευνητικά κριτήρια.
2. Τυχόν Επαγγελματικά κριτήρια.

6.2 Οι δυνατότητες και οι ανάγκες του Τμήματος σε προσωπικό και υλικοτεχνική υποδομή

Το Πρόγραμμα Μεταπτυχιακών Σπουδών θα λειτουργήσει στις εγκαταστάσεις του Τμήματος Πληροφορικής του Δ.Π.Θ., με την υπάρχουσα υποδομή στην οποία περιλαμβάνεται εξοπλισμός υψηλής τεχνολογίας.

7. Χρονική διάρκεια λειτουργίας του ΠΜΣ, αναλυτικό κόστος της αναγκαίας υλικοτεχνικής υποδομής και λειτουργίας, πηγές χρηματοδότησής του

7.1 Χρονική διάρκεια λειτουργίας του ΠΜΣ

Το ΠΜΣ θα λειτουργήσει από την έναρξη του και για τα επόμενα οκτώ ακαδημαϊκά έτη. Μετά τη λήξη της περιόδου αυτής, θα αξιολογηθεί η δυνατότητα συνέχισης της λειτουργίας του σύμφωνα με τις προβλεπόμενες διατάξεις.

7.2 Κόστος της αναγκαίας υλικοτεχνικής υποδομής και λειτουργίας (ετήσιο)

Το ετήσιο κόστος λειτουργίας του ΠΜΣ (πλήρους και μερικής φοίτησης) για τον ενδεικτικό αριθμό εκατό (100) σπουδαστών υπολογίζεται σε 400.000 ευρώ και κατανέμεται ως εξής:

A/A	ΚΑΤΗΓΟΡΙΑ ΔΑΠΑΝΗΣ	ΠΟΣΑ (σε ευρώ)
1	Κόστος Εκπαίδευσης	168.000
2	Κόστος Βοηθών Καθηγητών	6.000
3	Γραμματειακή Υποστήριξη 1	10.000
3	Γραμματειακή Υποστήριξη 2	10.000
4	Τεχνική Υποστήριξη 1	9.000
5	Τεχνική Υποστήριξη 2	9.000
6	Μέλος 1 ΠΜΣ	6.000
7	Μέλος 2 ΠΜΣ	6.000
8	Μέλος 3 ΠΜΣ	3.000
9	Μέλος 4 ΠΜΣ	3.000
10	Διευθυντής Msc	14.000
11	Μετακινήσεις	6.000
12	Προβολή	6.000
13	Εξοπλισμός	15.000
14	Λοιπά (Αναλώσιμα Συντήρηση Εξοπλισμού)	9.000
	Μερικό Σύνολο (70%)	280.000
	Έμμεσες Δαπάνες (30%)	120.000
	ΣΥΝΟΛΟ	400.000

Το κόστος ανά φοιτητή του ΠΜΣ ανέρχεται στο ποσό των 4.000 ευρώ ανεξάρτητα από το σενάριο φοίτησης (full time, part time).

Ένα τμήμα Μαθήματος το οποίο συγκεντρώνει πλέον των είκοσι τεσσάρων (24) φοιτητών δύναται να απασχολεί πρόσθετο βοηθητικό διδακτικό προσωπικό.

Θα μπορεί να υπάρχει μέριμνα εκπνώσεων σε ειδικές κατηγορίες σπουδαστών (π.χ. ΑΜΕΑ, πολύτεκνους, ομάδες εκπαιδευομένων που απασχολούνται στην ίδια επιχείρηση κ.λπ.).

Τα παραπάνω ποσά είναι δυνατόν να τροποποιηθούν με απόφαση της Συνέλευσης του Τμήματος, έπειτα από σχετική εισήγηση της Συντονιστικής Επιτροπής του ΠΜΣ (βλ. άρθρο 9).

7.3 Πηγές χρηματοδότησης του ΠΜΣ

Το κόστος λειτουργίας του ΠΜΣ θα καλυφθεί από διδάκτρα και χορηγίες μετά από σύμφωνη γνώμη της Συνέλευσης του Τμήματος. Επίσης πόροι αναμένεται να προκύπτουν και από την εκτέλεση ερευνητικών προγραμμάτων, την ανάπτυξη, παραγωγή και αξιοποίηση εκπαιδευτικού υλικού στα πλαίσια του ΠΜΣ, παροχές, δωρεές και κληροδοτήματα.

8. Συνέλευση Ειδικής Σύθεσης (ΣΕΣ)

Απαρτίζεται από τον Πρόεδρο του Τμήματος Πληροφορικής, τους Καθηγητές της Συνέλευσης του Τμήματος και δύο (2) μεταπτυχιακούς φοιτητές του ΠΜΣ.

9. Συντονιστική Επιτροπή (ΣΕ) του ΠΜΣ

Είναι αρμόδια για την παρακολούθηση και το συντονισμό του ΠΜΣ αποτελείται από πέντε (5) μέλη και ορίζεται από τη Συνέλευση του Τμήματος.

Ως Πρόεδρος της ΣΕ ορίζεται ο Διευθυντής του ΠΜΣ. 1ο Μέλος: Λειτουργεί ως Αναπληρωτής Διευθυντής του ΠΜΣ και αντικαθιστά τον Διευθυντή του ΠΜΣ σε περιπτώσεις που ο Διευθυντής δεν είναι διαθέσιμος, εισηγείται ομιλητές, σεμινάρια κ.λπ., συντονίζει τους εξωτερικούς Ακαδημαϊκούς Συνεργάτες του ΠΜΣ.

2ο Μέλος: Λειτουργεί ως Συντονιστής των Ευρωπαϊκών Εταιριών που συνεργάζονται και πλαισιώνουν το ΠΜΣ οργανώνοντας παράλληλα τις ημέρες καριέρας (Career Days), αναζητά νέες συνέργειες και πόρους χρηματοδότησης του ΠΜΣ.

3ο Μέλος: Είναι υπεύθυνο για δράσεις διάχυσης του ΠΜΣ, διαγωνισμούς, προβολή κ.λπ. και συνεργάζεται με το 2ο Μέλος για την οργάνωση των Career Days του ΠΜΣ.

4ο Μέλος: Είναι υπεύθυνο για το συντονισμό των ερευνητικών δράσεων του ΠΜΣ, αγοράς και διάθεσης εξοπλισμού, συντονισμό και παρακολούθηση των Independent Study.

10. Διευθυντής του ΠΜΣ

Ο Διευθυντής του ΠΜΣ έχει τη διοικητική μέριμνα του ΠΜΣ και την ευθύνη της αποτελεσματικής εφαρμογής του Προγράμματος για τρία χρόνια με δυνατότητα επανεκλογής.

Εισηγείται στη Συντονιστική Επιτροπή και στη Συνέλευση Ειδικής Σύθεσης του Τμήματος κάθε θέμα που αφορά την αποτελεσματική εφαρμογή του ΠΜΣ.

Προεδρεύει της ΣΕ.

11. Επιστημονική Συμβουλευτική Επιτροπή (ΕΣΕ)

Η κριτική αποτίμηση και οριοθέτηση των κατευθύνσεων του ΠΜΣ θα γίνει από τριμελή συμβουλευτική επιτροπή, αποτελούμενη από διακεκριμένους επιστήμονες σύμφωνα με τις διεθνείς πρακτικές και τις ανάγκες της ελληνικής οικονομίας και κοινωνίας. Μέσα στις αρμοδιότητες της ΕΣΕ είναι και η χάραξη στρατηγικών έρευνας και διδασκαλίας καθώς και η προσθήκη ή/και αφαίρεση συγκεκριμένων μαθημάτων. Ο ορισμός της επιτροπής αυτής γίνεται από τα μέλη της Συντονιστικής Επιτροπής του ΠΜΣ.

12. Γραμματεία Προγράμματος

Θα προσληφθούν για τη γραμματειακή απασχόληση στο ΠΜΣ, πτυχιούχοι ΑΕΙ, με άριστη γνώση Η/Υ, υπηρεσιών Internet και πτυχίο γλωσσομάθειας Αγγλικής γλώσσας (επιπέδου Proficiency ή συναφές), με αποδεδειγμένη ανάλογη εργασιακή εμπειρία.

13. Τεχνικό Προσωπικό

Ως τεχνικοί του ΠΜΣ θα προσληφθούν πτυχιούχοι ΑΕΙ με αποδεδειγμένη επαγγελματική πενταετή εμπειρία στους ακόλουθους τομείς:

- Web development και ψηφιοποίηση υλικού.
- Διαχείριση server και Learning Management Systems (τύπου Moodle ή ανάλογης πλατφόρμας).
- Δίκτυα και service H/Y.
- Ηλεκτρονικά και Συστήματα Τηλεδιάσκεψης.

14. Κριτήρια επιλογής μεταπτυχιακών φοιτητών

- Βαθμολογία: Συνεκτίμηση του βαθμού πτυχίου, της βαθμολογίας στα προπτυχιακά μαθήματα που είναι σχετικά με τα μαθήματα του ΠΜΣ και του βαθμού διπλωματικής εργασίας (όπου αυτή προβλέπεται στο προπτυχιακό επίπεδο).

- Γλωσσομάθεια: Η πιστοποιημένη από επίσημους φορείς γνώση της αγγλικής γλώσσας, όπως προκύπτει από την κατοχή ενός από τα εξής πτυχία: (α) Ελληνικό Πτυχίο Γλωσσομάθειας για την Αγγλική Γλώσσα επιπέδου τουλάχιστον Β2 ή άλλο ισοδύναμο, (β) IELTS, με ελάχιστο βαθμό 6,5 που να έχει αποκτηθεί στο ημερολογιακό έτος μέχρι τέσσερα χρόνια πριν από τη δημοσίευση της προ-

κήρυξης, (γ) TOEFL, με ελάχιστο βαθμό 180, που να έχει αποκτηθεί στο ημερολογιακό έτος μέχρι τέσσερα χρόνια πριν από τη δημοσίευση της προκήρυξης και (δ) πτυχίο από Αγγλόφωνο Πανεπιστήμιο ή πτυχίο Αγγλικής φιλολογίας, (ε) επάρκεια αγγλικής γλώσσας που χορηγεί το κέντρο ξένων γλωσσών του ΔΙΠΑΕ.

- Συνεκτίμηση της ερευνητικής και επαγγελματικής εμπειρίας των υποψηφίων.

15. Διδάσκοντες στο ΠΜΣ

Στη διδασκαλία των μεταπτυχιακών μαθημάτων δύναται να συμμετέχουν εκτός από μέλη ΔΕΠ του Τμήματος Πληροφορικής και μέλη άλλων τμημάτων του ΔΠΘ ή μέλη ΔΕΠ πανεπιστημίων της ημεδαπής και της αλλοδαπής, καθώς και άλλες κατηγορίες διδασκόντων σύμφωνα με το άρθρο 5 του ν. 3685/2008 (Α' 148) και τον ν. 4009/2011.

Η διδασκαλία των μαθημάτων και των ασκήσεων στο ΠΜΣ, ανατίθεται από τη Συντονιστική Επιτροπή του ΠΜΣ με απόφασή της, ύστερα από εισήγηση της Συνέλευσης των μελών ΔΕΠ του Τμήματος. Τα μέλη ΔΕΠ δεν επιτρέπεται να απασχολούνται αποκλειστικά μόνο στο ΠΜΣ.

ΠΑΡΑΡΤΗΜΑ*MSc in**Immersive Technologies-**Innovation in Education, Training and Game Design (IMT)**Πρόγραμμα ΠΜΣ***1st Semester****IMTC1: Fundamentals on Technology Enhanced Learning****COURSE OUTLINE****(1) GENERAL**

SCHOOL	School of Sciences		
ACADEMIC UNIT	Department of Computer Science		
LEVEL OF STUDIES	Postgraduate, MSc on Immersive Technologies		
COURSE CODE		SEMESTER	1 st
COURSE TITLE	IMTC1: Fundamentals on Technology Enhanced Learning		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures		3	
Total			7.5
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE	No special background or general knowledge is needed		

<i>general background, special background, specialised general knowledge, skills development</i>	
PREREQUISITE COURSES:	None
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	

(2) LEARNING OUTCOMES

<p>Learning outcomes</p> <p><i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> <i>Guidelines for writing Learning Outcomes</i>
<p>The course is designed as an easy way to introduce undergraduate students to theory, methods and techniques of technology enhanced learning. Technology enhanced learning is necessary for any online teaching or learning activity. Topics covered include basic concepts of technology enhanced learning and educational technologies, including online learning concepts, learning theories, information systems for learning and teaching and some enhanced topics.</p> <p>Upon successful completion of the course the student will be able to:</p> <ul style="list-style-type: none"> Describe concepts related to theory, methods and techniques used in technology enhanced learning. Understand different learning theories and methods regarding how online teaching and learning can occur. Identify different kind of educational technologies and how they can be used.

- Develop concepts for online learning and teaching scenarios
- Understand basic concepts of instructional design and how to use it
- Investigate with goal to find relevant material in the international literature, writing a scientific report, planning a project, working collectively and to solve related problems.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Project planning and management

Respect for difference and multiculturalism

Adapting to new situations

Respect for the natural environment

Decision-making

Showing social, professional and ethical responsibility and sensitivity to gender issues

Working independently

Team work

Criticism and self-criticism

Working in an international environment

Production of free, creative and inductive thinking

Working in an interdisciplinary environment

.....

Production of new research ideas

Others...

.....

Search for information

Working independently

Team work

Project planning and management

Production of new research ideas

(3) SYLLABUS

The taught modules concerning:

1. Introductory Concepts
2. Basic Concepts in technology enhanced learning
3. History of Online Education
4. Learning theories
5. Information systems for teaching and learning
6. Multimedia Theory

7. Microlearning – learning objects (videos)
8. Open Educational Resources
9. Research methodologies / research design in the field of technology enhanced learning
10. Future of educational technologies

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Distance Learning (synchronous and asynchronous)	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Online-presentation with the help of slides, Website of the course with supporting and auxiliary material, Contact by e-mail / discussion forum. In Seminars, implementation of learning and teaching concepts for using technology in education.	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	Activity	Semester workload
	Lectures	39
	Tutorial Exercises: Selected exercises are solved concerning different topics in technology enhanced learning. Implementation of methodologies and concepts of how to use technologies for education.	39
	Individual or team project	55
	Individual Study	54.5
	Course total	187.5
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public</i>	Final mark is calculated based on the following: <ul style="list-style-type: none"> • (20%) High-quality contributions to the Discussions • (80%) Written essays-reports/ Individual or Group Projects (or any combination) 	

<p><i>presentation, laboratory work, clinical examination of patient, art interpretation, other</i></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	
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(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- Related academic journals:

- Licklider, J. C. R. & Talyor, R. W. (1968). The Computer as a Communication Device. In: Science and Technology, 76, 21-44.
- Anderson, L.W. & Krathwohl, D.R. (2001). A taxonomy for learning, teaching, and assessment. A revision of Bloom's taxonomy of educational outcomes. New York: Longman
- Branch, R.M. (2009). Instructional design: The ADDIE approach. New York: Springer.
- Salmon, G. (2002). E-tivities. Der Schlüssel zu aktivem Online-Lernen. Zürich: Orell Füssli.
- British Journal of Educational Technology
- Computers and Education
- The International Review of Research in Open and Distributed Learning

IMTC2: Fundamentals of Augmented Reality
COURSE OUTLINE
(1) GENERAL

SCHOOL	School of Sciences		
ACADEMIC UNIT	Department of Computer Science		
LEVEL OF STUDIES	Postgraduate, MSc on Immersive Technologies		
COURSE CODE		SEMESTER	1 st
COURSE TITLE	IMTC2: Fundamentals of Augmented Reality		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures		3	
Total			7.5
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialised general knowledge, Skills development		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)			

(2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

This course presents an introduction to Augmented Reality, with emphasis on designing and developing Augmented Reality applications. The course covers Spatial Computing, Human Computer Interaction, Perception, Design Thinking, and Application Development. As part of the course, students will be tasked with designing, developing, and evaluating their own Augmented Reality application.

Upon successful completion of the course the student will be able to:

- Demonstrate knowledge and understand: State the conceptual origins, advantages, and disadvantages of various methods used for solving problems for the given application domain of Augmented Reality. The core topics include:
 - 3D content acquisition and handling including 3D modelling, photogrammetry, animation, mesh optimisation
 - Object recognition using image targets and fiducial markers
 - Environment mapping and spatial understanding
 - AR-specific interaction such as methods gaze, voice, gestures
- Brainstorm, review, and select use cases and match them to the range of AR toolkits and platforms available
- Develop iteratively, and in a team, an application utilising AR toolkits and platforms
- Apply AR-specific User-Centred Design and Software Engineering approaches

Based on the knowledge and skills acquired they should be able to (Key Competences):

- Present technical work, a use case and project progress, either verbally or in written reports
- Enact a variety of roles in a technical project team, as determined by the requirements of agile project management approaches

- Plan projects and meet milestones

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Project planning and management

Respect for difference and multiculturalism

Adapting to new situations

Respect for the natural environment

Decision-making

Showing social, professional and ethical responsibility and sensitivity to gender issues

Working independently

Criticism and self-criticism

Team work

Production of free, creative and inductive thinking

Working in an international environment

.....

Working in an interdisciplinary environment

Others...

Production of new research ideas

.....

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Working independently

Team work

Working in an interdisciplinary environment

Production of new research ideas

Project planning and management

(3) SYLLABUS

The taught modules concerning:

- Lectures:
 1. Introduction to AR
 2. Unity Basics
 3. HCI methodologies (Evaluation, Design Thinking)
 4. Perception
 5. Software Engineering
 6. History of AR

<ul style="list-style-type: none"> 7. Technology Overview 8. Geometric Algebra 9. Storytelling with AR 10. Design Inspiration 11. Careers in AR 12. Research Directions • Workshops: <ul style="list-style-type: none"> 1. Modelling AR UI/UX 2. Markers 3. Gaze 4. 3D modelling 5. Gesture 6. Voice 7. 3D scanning and animation 8. Spatial Understanding

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Distance Learning (synchronous and asynchronous)	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Presentation with the help of slides, Website of the course with supporting and auxiliary material, Contact by e-mail. In Seminars, implementation of methodologies and algorithms in real problems in Unity 3D.	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	Activity	Semester workload
	Lectures	39
	Tutorial Exercises	39
	Individual or team project Feedback will be given as students attempt practical problems. The project builds on the knowledge from the lectures and workshops, and the feedback given during classes will inform the student in their attempts on the final project.	52

	To provide formative feedback, students will be asked to present their project ideas (proposal elevator pitch), give an interim progress report (presentation), and demo.	
	Individual Study	31.5
	Course total	187.5
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i> <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	Final mark is calculated based on the following: <ul style="list-style-type: none"> • (20%) High-quality contributions to the Discussions • (80%) Written essays-reports/ Individual or Group Projects (or any combination) 	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography: - Related academic journals: <ul style="list-style-type: none"> • The Open Augmented Reality Teaching Book - A foundation and good practices http://codereality.net/the-open-augmented-reality-teaching-book/ • Speicher, Hall, Nebeling (2019): What is Mixed Reality?, In: CHI 2019, May 4–9, 2019, Glasgow, Scotland, UK • Augmented Reality: Principles and Practice. Tobias Höllerer, Dieter Schmalstieg. • Handbook of Augmented Reality. Furht, B. • Understanding Augmented Reality. Concepts and Applications. Alan Craig. • ISMAR - The IEEE International Symposium on Mixed and Augmented Reality

IMTC3: Immersive Software**COURSE OUTLINE****(1) GENERAL**

SCHOOL	School of Sciences		
ACADEMIC UNIT	Department of Computer Science		
LEVEL OF STUDIES	Postgraduate, MSc on Immersive Technologies		
COURSE CODE		SEMESTER	1 st
COURSE TITLE	IMTC3: Immersive Software		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures		3	
Total			7.5
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialised general knowledge Skills development		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)			

(2) LEARNING OUTCOMES**Learning outcomes**

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will

acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Augmented Reality, Virtual Reality and Voice Interfaces, are redefining Digital Experiences and reshape the way we engage with the world. The course is designed as an easy way to introduce students to the basic tools necessary, in order to build immersive software. The topics covered include basic concepts of Augmented Reality, Virtual Reality and Voice Interfaces. These technologies combined can offer immersive digital experiences that can be used in many fields, such as education, tourism, culture and industry.

Upon successful completion of the course students will be able to:

- Describe basic concepts of immersive software.
- Identify and compare various technologies used in building immersive software.
- Design immersive software considering limitations of the environment.
- Bring together various innovative technologies in order to build digital experiences.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Project planning and management

Respect for difference and multiculturalism

Adapting to new situations

Respect for the natural environment

Decision-making

Showing social, professional and ethical responsibility and sensitivity to gender issues

Working independently

Criticism and self-criticism

Team work

Working in an international environment

Production of free, creative and inductive thinking

Working in an interdisciplinary environment

.....

Production of new research ideas

Others...

.....

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Working independently

Team work

Project planning and management

Production of new research ideas

(3) SYLLABUS

The content of the course includes:

1. Introductory concepts of Immersive Software
2. Applications of Immersive Software
3. Augmented Reality applications and usages
4. Building Augmented Reality applications
5. Virtual Reality applications and usages
6. Building Virtual Reality applications
7. Designing Voice User Interfaces (VUIs)
8. Building applications for Voice Assistants (Amazon Alexa)
9. Immersive Software Engineering Best Practices
10. Combining innovative technologies to build immersive digital experiences

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Distance Learning (synchronous and asynchronous)	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	<ul style="list-style-type: none"> • Presentation with the help of slides. • Website of the course with supporting and auxiliary material. • Contact by e-mail, or Skype. 	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	Activity	Semester workload
	Lectures	39
	Tutorial Exercises: Practical implementation of building immersive software in various programming environments.	39
	Individual or team project	55
	Individual Study	54.5
	Course total	187.5
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i>	Final mark is calculated based on the following: <ul style="list-style-type: none"> • (20%) High-quality contributions to the Discussions • (80%) Written essays-reports/ Individual or Group Projects (or any combination) 	

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	
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(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- Related academic journals:

- Jonathan Linowes, "Augmented Reality for Developers: Build practical augmented reality applications with Unity, ARCore, ARKit, and Vuforia", Packt Publishing, 2017, ISBN-10: 1787286436
- Tony Parisi, "Learning Virtual Reality: Developing Immersive Experiences and Applications for Desktop, Web, and Mobile", 1st Edition, O'Reilly Media, 2015, ISBN-10: 9781491922835
- Sam Williams, "Hands-On Chatbot Development with Alexa Skills and Amazon Lex: Create custom conversational and voice interfaces for your Amazon Echo devices and web platforms", 1st Edition, Packt Publishing, 2018, ISBN-10: 1788993489
- Augmented Reality Journal (Oxford Academic)
- Virtual Reality Journal (Springer)
- International Journal of Virtual and Augmented Reality (IGI Global)

IMTC4: Security and privacy issues in Immersive Technologies
COURSE OUTLINE
(1) GENERAL

SCHOOL	School of Sciences		
ACADEMIC UNIT	Department of Computer Science		
LEVEL OF STUDIES	Postgraduate, Msc on Immersive Technologies		
COURSE CODE		SEMESTER	1 st
COURSE TITLE	IMTC4: Security and privacy issues in Immersive Technologies		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures		3	
Total			7.5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialised general knowledge, Skills development		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)			

(2) LEARNING OUTCOMES
Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

This course introduces the concepts and issues related to security and privacy as well, as safety issues for immersive technologies, necessary for establishing a robust environment for running applications and securely managing their data. Students will learn to build their applications following the security and privacy by design principles and therefore be able to identify the threats and needs for their virtual and augmented reality applications, choose the appropriate set of security mechanisms and enforce them.

Upon successful completion of the course students will be able to:

- Evaluate the information security and privacy needs of their applications.
- Assess cybersecurity risks to adequately protect the environment's critical information and assets.
- Identify and implement appropriate security and privacy solutions.
- Implement safety protection mechanisms for many types of systems, including safety-critical ones.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>
<i>Adapting to new situations</i>	<i>Respect for difference and multiculturalism</i>
<i>Decision-making</i>	<i>Respect for the natural environment</i>
<i>Working independently</i>	<i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>
<i>Team work</i>	<i>Criticism and self-criticism</i>
<i>Working in an international environment</i>	<i>Production of free, creative and inductive thinking</i>
<i>Working in an interdisciplinary environment</i>	<i>.....</i>
<i>Production of new research ideas</i>	<i>Others...</i>
	<i>.....</i>

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Working independently

Team work

Project planning and management

Production of new research ideas

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(3) SYLLABUS

The taught modules concerning:

1. Introduction to Information Security
2. Threats and Security Management
3. Cryptography
4. Authentication and access control mechanisms
5. Communications security
6. Data Privacy
7. Privacy enhancing technologies
8. Safety protection
9. Safety-critical systems

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Distance Learning (synchronous and asynchronous)	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Presentation with the help of slides, Website of the course with supporting and auxiliary material, Contact by e-mail.	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	Activity	Semester workload
	Lectures	39
	Tutorial Exercises	39
	Individual or team project	55
	Individual Study	54.5
	Course total	187.5
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i>	Final mark is calculated based on the following: <ul style="list-style-type: none"> • (20%) High-quality contributions to the Discussions • (80%) Written essays-reports/ Individual or Group Projects (or any combination) 	

<i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	
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(5) ATTACHED BIBLIOGRAPHY

- *Suggested bibliography:*

- *Related academic journals:*

- Charles P. Pfleeger, Shari Lawrence Pfleeger, Jonathan Margulies. Security in Computing, 5th Edition, Prentice Hall
- William Stallings. Information Privacy Engineering and Privacy by Design: Understanding Privacy Threats, Technology, and Regulations Based on Standards and Best Practices, Addison-Wesley Professional; 1st edition, 2019
- William Stallings. Effective Cybersecurity: A Guide to Using Best Practices and Standards. Addison-Wesley Professional, 2018.
- Douglas J. Landoll. Information Security Policies, Procedures, and Standards: A Practitioner's Reference, Auerbach Publications, 2016

2nd Semester

IMTC5: Cross-Platform Game Development

COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Sciences		
ACADEMIC UNIT	Department of Computer Science		
LEVEL OF STUDIES	Postgraduate, MSc on Immersive Technologies		
COURSE CODE		SEMESTER	2 nd
COURSE TITLE	IMTC5: Cross-Platform Game Development		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures		3	
Total			7.5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialised general knowledge, Skills development		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)			

(2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will

acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

The course is designed to introduce postgraduate students to theory, methods and techniques of game development by exploiting popular game engines. Game development is very popular ICT research and development area, focusing in applications of diverse fields including entertainment, cultural heritage, education, artificial intelligence, sociology, military and health systems. The main goal of this course is to enable students to understand the importance and the capabilities of specific software packages referred to as game engines (GameMaker, Stencyl) for the implementation of cross-platform games. Also, will involve students in the development of complex virtual environments that simulate the real world, which will highlight the importance of these tools. Students will gain experience and technical know-how in game systems and technologies and will be introduced to the process of developing cross-platform games or applications for a variety of purposes. Topics covered include first-person shooter, third-person shooter, physics, lightening, rendering, graphical user interface, animation, particle systems and cross-platform development.

Upon successful completion of the course the student will be able to:

- Describe concepts related to theory, methods and techniques used in game development.
- Develop interactive games for a variety of OS including web (cross-platform) development.
- Deal with graphical and realism issues for game purposes including lightening, effects, rendering, sound, particle systems etc.
- Implement algorithms for the creation of dynamic content.
- Investigating relevant material in the international literature, writing a scientific report, planning a project, working collectively and to solve complex game development problems.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management
Adapting to new situations	Respect for difference and multiculturalism
Decision-making	Respect for the natural environment
Working independently	Showing social, professional and ethical responsibility and sensitivity to gender issues
Team work	Criticism and self-criticism
Working in an international environment	Production of free, creative and inductive thinking
Working in an interdisciplinary environment
Production of new research ideas	Others...

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Working independently

Team work

Working in an interdisciplinary environment

Project planning and management

Adapting to new situations

Production of new research ideas

(3) SYLLABUS

The taught modules include:

1. Introductory Concepts, Type of Games, Game Engines
2. Game development with traditional programming languages
3. Development based on engine: Scene design, Actors' management, Dashboard, Tiles, Behaviours, Gravity Screen Management, Cameras, Collisions, Enemies, Sensors, Events, Randomness, Timers, Decisions, Animation, Fonts, Attributes, Backgrounds, Special Effects, Progression, Messages, Buttons, Menus, Sounds, Shooting, Transitions, Loading and Saving
4. Case Studies
 - I. A first person shooter game
 - II. A word Search puzzle
 - III. A card game

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Distance Learning (synchronous and asynchronous)	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Interactive web-based learning management systems and dynamic conferencing systems. Multimedia based presentation. Website of the course with supporting and auxiliary material. Contact by e-mail. In Seminars, implementation of methodologies and algorithms in real problems by exploiting game engines like Unity and their assets.	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i>	Activity	Semester workload
	Lectures	39
	Tutorial Exercises: Selected exercises are solved concerning different topics in game development processes. Implementation of methodologies and algorithms to real	39

(5) ATTACHED BIBLIOGRAPHY

- Related academic journals and conferences:

- "Education: Learning to Program | Blog | YoYo Games." [Online]. Available: <https://www.yoyogames.com/blog/540/education-learning-to-program>. [Accessed: 26-Dec-2019].
- "FREE Book: Creating Games with Stencyl - Level 01." [Online]. Available: <http://community.stencyl.com/index.php?topic=50069.0>. [Accessed: 26-Dec-2019].
- "Game Development with GameMaker Studio 2: Make Your Own Games with GameMaker Language 1.4.0.1" [Online]. Available: <https://www.amazon.com/Game-Development-GameMaker-Studio-Language-ebook/dp/B07X8TZQ14>. [Accessed: 26-Dec-2019].
- "Introduction To Game Design & Programming in GameMaker Studio 2 (LearnGameMakerStudio Book 1), Ben Tyers, eBook - Amazon.com." [Online]. Available: <https://www.amazon.com/Introduction-Design-Programming-GameMaker-Studio-ebook/dp/B07N591SJ5>. [Accessed: 26-Dec-2019].
- "Learning Stencyl 3.x Game Development: Beginner's Guide: Innes Borkwood: 9781849695962" [Online]. Available: https://www.amazon.com/gp/product/1849695962/ref=as_li_tf_tl?ie=UTF8&camp=1789&creative=9321&creativeASIN=1849695962&linkCode=as2&tag=stencylbook-20. [Accessed: 26-Dec-2019].
- "The Computer Games Journal - Springer." [Online]. Available: <https://link.springer.com/journal/4086>. [Accessed: 26-Dec-2019].

IMTC6: Immersive Systems IoT**COURSE OUTLINE****(1) GENERAL**

SCHOOL	School of Sciences		
ACADEMIC UNIT	Department of Computer Science		
LEVEL OF STUDIES	Postgraduate, MSc on Immersive Technologies		
COURSE CODE		SEMESTER	2 nd
COURSE TITLE	IMTC6: Immersive Systems IoT		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures		3	
Total			7.5
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Special background, Specialised general knowledge		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)			

(2) LEARNING OUTCOMES**Learning outcomes**

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

This course covers the technical and experiential aspects of digital systems used for the realization of VR, AR and MR based immersive environments in current and future virtual, augmented and mixed reality platforms. The material covers a wide range of literature and practice following the evolution of all supporting technologies and including input and output 3D hardware interfaces, computer vision and optics related techniques, as well as motion tracking technologies. Furthermore, the course presents and analyses IoT oriented communication and embedded systems that enable connectivity of immersive devices.

Upon successful completion of the course the student will be able to:

- Describe the evolution and special characteristics of immersive systems
- Identify the available hardware technologies for implementing 3D user input interfaces and interaction techniques
- Explain computer vision concepts for scene understanding
- Describe light, optics, and motion tracking techniques
- Understand the networking technologies for immersive hardware interconnection
- Describe the types, components, and characteristics of embedded systems
- Realize what are the trends and future applications regarding xR-based systems

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Project planning and management

Respect for difference and multiculturalism

Adapting to new situations

Respect for the natural environment

Decision-making

Showing social, professional and ethical responsibility and sensitivity to gender issues

Working independently

Team work

Criticism and self-criticism

Working in an international environment

Production of free, creative and inductive thinking

Working in an interdisciplinary environment

.....

Production of new research ideas

Others...

.....

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Working independently

Working in an international environment

Production of new research ideas

Production of free, creative and inductive thinking

(3) SYLLABUS

The taught modules concerning:

1. Introduction to Immersive Systems
2. Hardware Technologies for 3D User Interfaces
3. 3D User Interface Input Hardware
4. 3D Interaction Techniques
5. Computer Vision for Scene Understanding
6. Light and Optics
7. Motion Tracking
8. Technologies for Immersive Hardware Interconnection
9. IoT Embedded Systems
10. xR Trends and Future Applications

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Distance Learning (synchronous and asynchronous)	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Presentation with the help of slides, Website of the course with supporting and auxiliary material, Online Sessions, contact by e-mail.	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	Activity	Semester workload
	Lectures	39
	Tutorial Exercises: Selected exercises are solved concerning different topics of the course.	39
	Individual or team project	55
	Individual Study	54.5
	Course total	187.5
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical</i>	Final mark is calculated based on the following: <ul style="list-style-type: none"> • (20%) High-quality contributions to the Discussions • (80%) Written essays-reports/ Individual or Group Projects (or any combination) 	

<i>examination of patient, art interpretation, other</i>	
<i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- Related academic journals:

- Steven M. LaValle, "Virtual Reality", Cambridge University Press, 2017.
- Kelly S. Hale (Editor), Kay M. Stanney (Editor). 2014. Handbook of Virtual Environments: Design, Implementation, and Applications, Second Edition (Human Factors and Ergonomics) ISBN-13: 978-1466511842
- Jason Jerald. 2015. The VR Book: Human-Centered Design for Virtual Reality. Association for Computing Machinery and Morgan & Claypool Publishers.
- Gerard Jounghyun Kim, "Designing Virtual Systems: The Structured Approach", 2005.
- Doug A Bowman, Ernest Kuijff, Joseph J LaViola, Jr and Ivan Poupyrev, "3D User Interfaces, Theory and Practice", Addison Wesley, USA, 2005.
- Oliver Bimber and Ramesh Raskar, "Spatial Augmented Reality: Merging Real and Virtual Worlds", 2005.
- Burdea, Grigore C and Philippe Coiffet, "Virtual Reality Technology", Wiley Interscience, India, 2003.
- William R Sherman and Alan B Craig, "Understanding Virtual Reality: Interface, Application and Design (The Morgan Kaufmann Series in Computer Graphics)". Morgan Kaufmann Publishers, San Francisco, CA, 2002.
- Virtual Reality, Springer
- International Journal of Virtual Technology and Multimedia, Inderscience
- International Journal of Virtual and Augmented Reality, IGI
- IEEE Internet of Things
- PRESENCE: Virtual and Augmented Reality, The MIT Press

IMTC7: Fundamentals of Virtual Reality
COURSE OUTLINE
(1) GENERAL

SCHOOL	School of Sciences		
ACADEMIC UNIT	Department of Computer Science		
LEVEL OF STUDIES	Postgraduate, MSc on Immersive Technologies		
COURSE CODE		SEMESTER	2 nd
COURSE TITLE	IMTC7: Fundamentals of Virtual Reality		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures		3	
Total			7.5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialised general knowledge, Skills development		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)			

(2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

This course presents an introduction to Virtual Reality, with emphasis on designing and developing Virtual Reality applications. The course is designed for students who are new to virtual reality and want to learn about the principles of VR technology including optics, displays, stereopsis, tracking, and major hardware platforms.

Upon successful completion of the course the student will be able to:

- Demonstrate knowledge and understand the physical principles of VR, state the conceptual origins, advantages, and disadvantages of various methods used for solving problems for the given application domain of Virtual Reality. The core topics include:
 - Created and deployed a VR application.
 - Setup and use Unity
 - You will understand and you will use that knowledge to create a comfortable, high-performance VR application using Unity.
- Brainstorm, review, and select use cases and match them to the range of VR toolkits and platforms available
- Develop iteratively, and in a team, an application utilising VR toolkits and platforms
- Apply VR-specific User-Centred Design and Software Engineering approaches

Based on the knowledge and skills acquired they should be able to (Key Competences):

- Present technical work, a use case and project progress, either verbally or in written reports
- Plan projects and meet milestones

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Project planning and management

Respect for difference and multiculturalism

Adapting to new situations

Respect for the natural environment

Decision-making

Showing social, professional and ethical responsibility and sensitivity to gender issues

Working independently

Criticism and self-criticism

Team work

Production of free, creative and inductive thinking

Working in an international environment

.....

Working in an interdisciplinary environment

Others...

Production of new research ideas

.....

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Working independently

Team work

Working in an interdisciplinary environment

Production of new research ideas

Project planning and management

(3) SYLLABUS

The taught modules concerning:

1. Introduction to VR
2. Unity Basics
3. History of VR development
4. Physical principles of VR
5. Architecture of VR systems
6. Platforms & Paradigms
7. Explore native, game engines, and web platforms
8. Experiment with tracking in VR works
9. Experiment with Haptic senses and feedback
10. Explore different platforms (SDK) currently available for VR development
11. Open an app in Google cardboard
12. Challenges in VR

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Distance Learning (synchronous and asynchronous)	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Presentation with the help of slides, Website of the course with supporting and auxiliary material, Contact by e-mail. In Seminars, implementation of methodologies and algorithms in real problems in Unity 3D.	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	Activity	Semester workload
	Lectures	39
	Tutorial Exercises	39
	Individual or team project. Feedback will be given as students attempt practical problems. The project builds on the knowledge from the lectures and workshops, and the feedback given during classes will inform the student in their attempts on the final project.	50

	To provide formative feedback, students will be asked to present their project ideas (proposal elevator pitch), give an interim progress report (presentation), and demo.	
	Individual Study	33.5
	Course total	187.5
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i> <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	Final mark is calculated based on the following: <ul style="list-style-type: none"> • (20%) High-quality contributions to the Discussions • (80%) Written essays-reports/ Individual or Group Projects (or any combination) 	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Related academic journals:
<ul style="list-style-type: none"> • Samuel Greengard (2019) Virtual Reality (The MIT Press Essential Knowledge series) MIT Press (September 10, 2019) ISBN-10: 0262537524 • Ajit Singh (2019) Virtual Reality: Human Computer Interaction. Independently published (June 26, 2019) ISBN-10: 1076340458 • Jesse Glover (2019) Complete Virtual Reality and Augmented Reality Development with Unity: Leverage the power of Unity and become a pro at creating mixed reality applications Packt Publishing (April 17, 2019) ISBN-10: 1838648186 • Penny de Byl (2019) Holistic Game Development with Unity 3e: An All-in-One Guide to Implementing Game Mechanics, Art, Design and Programming 3rd Edition ISBN-13: 978-1138480629 • Terry Taylor (2019) How Virtual Reality is changing Real Estate Marketing 2nd Edition. Independently published (August 19, 2019) ISBN -10: 1687252769

IMTC8: Immersive Technologies for Business Intelligence
COURSE OUTLINE
(1) GENERAL

SCHOOL	School of Sciences		
ACADEMIC UNIT	Department of Computer Science		
LEVEL OF STUDIES	Postgraduate, MSc on Immersive Technologies		
COURSE CODE		SEMESTER	2 nd
COURSE TITLE	IMTC8: Immersive Technologies for Business Intelligence		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures		3	
Total			7.5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialised general knowledge, Skills development		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)			

(2) LEARNING OUTCOMES
Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Immersive technologies (IT) can contribute to business in various ways such as training, product promotion and/or presentation, after sales services, analytics presentation of business-related data etc. The main aim of the course is to introduce students in the potential and applications of immersive technologies to business.

The topics covered include a general analysis of various business limitations, the way immersive technologies can fill this gap and presentation of how IT can be applied to various business fields.

Upon successful completion of the course the student will be able to:

- Describe concepts related to the applications of immersive technologies in business.
- Understand the way in which immersive technologies can be used to solve current problems to business.
- Identify and compare various immersive technologies applications as these are used in business and select suitable applications to address a number of real problems
- Design and propose integrated solutions for various business-related applications
- Implement basic immersive applications for business problems
- Investigate with goal to find relevant material in the international literature, writing a scientific report, planning a project, working collectively and to solve related problems.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>
<i>Adapting to new situations</i>	<i>Respect for difference and multiculturalism</i>
<i>Decision-making</i>	<i>Respect for the natural environment</i>
<i>Working independently</i>	<i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>
<i>Team work</i>	<i>Criticism and self-criticism</i>
<i>Working in an international environment</i>	<i>Production of free, creative and inductive thinking</i>
<i>Working in an interdisciplinary environment</i>	<i>.....</i>
<i>Production of new research ideas</i>	<i>Others...</i>
	<i>.....</i>

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Working independently

Team work

Project planning and management

Production of new research ideas

(3) SYLLABUS

The taught modules concerning:

1. Introductory Concepts of business and information technology
2. Applications of immersive technologies to business
3. Immersive training technology
4. Industrial application of immersive technologies
5. Immersive product promotion and presentation
6. Immersive after-sales and distant services
7. Business information visualization through immersive technologies
8. Immersive analytics
9. Immersive collaborative virtual environments
10. Designing business immersive applications
11. Building basic immersive business applications

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Distance Learning (synchronous and asynchronous)	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	<ul style="list-style-type: none"> • Presentation with the help of slides and interactive material. • LMS course page with supporting and auxiliary material. • Contact by e-mail, Enhanced communication channels of LMS platform, Skype and other teleconference systems meetings. 	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	Activity	Semester workload
	Lectures	39
	Tutorial Exercises: Selected exercises are solved concerning different topics of business immersive technologies application	39
	Individual or team project	55
	Individual Study	54.5
	Course total	187.5
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions,</i>	Final mark is calculated based on the following: <ul style="list-style-type: none"> • (20%) High-quality contributions to the Discussions 	

<i>open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i>	<ul style="list-style-type: none">• (80%) Written essays-reports/ Individual or Group Projects (or any combination)
<i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	

(5) ATTACHED BIBLIOGRAPHY

<p>- <i>Suggested bibliography:</i></p> <p>- <i>Related academic journals:</i></p> <ul style="list-style-type: none">• Virtual Reality, Springer• International Journal of Human-computer Interaction, Taylor & Francis• International Journal of Computer-Supported Collaborative Learning, Springer• International Journal of Computing & Business Research.• Business Horizons, Elsevier• Computers & Education, Elsevier• IEEE Transactions on Learning Technologies• Fuchs, P., Moreau, G., & Guitton, P. (2011). Virtual reality: concepts and technologies. CRC Press.• Harvard Business Review• Computers in Human Behaviour, Elsevier• Business Information Review, SAGE Journals

MTP1: MSc Thesis Project Part I
COURSE OUTLINE
(6) GENERAL

SCHOOL	School of Sciences		
ACADEMIC UNIT	Department of Computer Science		
LEVEL OF STUDIES	Postgraduate, MSc on Immersive Technologies		
COURSE CODE		SEMESTER	2 nd
COURSE TITLE	MTP1: MSc Thesis Project Part I		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
Total			15
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialised general knowledge, Skills development		
PREREQUISITE COURSES:	IMTC1, IMTC2, IMTC3, IMTC4		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)			

(7) LEARNING OUTCOMES
Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A	
<ul style="list-style-type: none"> • Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area • Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B • Guidelines for writing Learning Outcomes 	
Upon successful completion of the MSc Thesis Project Part I, participants will be able to:	
<ul style="list-style-type: none"> • To search, compare and synthesize scientific sources relevant to the subject of their MSc Thesis Project. • Critically evaluate relevant literature and identify gaps and research perspectives. • Formulate and present a coherent theoretical framework for their thesis. • Use appropriate literature management tools and adhere to the principles of academic ethics. • Produce a structured scientific text that forms the basis of the MSc Thesis Project 	
General Competences	
Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?	
Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management
Adapting to new situations	Respect for difference and multiculturalism
Decision-making	Respect for the natural environment
Working independently	Showing social, professional and ethical responsibility and sensitivity to gender issues
Team work	Criticism and self-criticism
Working in an international environment	Production of free, creative and inductive thinking
Working in an interdisciplinary environment
Production of new research ideas	Others...

Search for, analysis and synthesis of data and information, with the use of the necessary technology	
Working independently	
Project planning and management	
Production of new research ideas	
Promoting free, creative and inductive thinking	

(8) SYLLABUS

This course introduces postgraduate students to the methodology of scientific research, with emphasis on literature review and the development of the research framework of the MSc Thesis Project. The aim of the course is to familiarize students with the procedures of collecting, analyzing and synthesizing scientific literature, as well as to develop skills of critical reading and evaluation of scientific sources. At the same time, the course guides students in formulating their research

question and in writing the first part of the thesis, which includes the review of the literature, the presentation of the research area and the documentation of the research problem.

Students will be trained in the use of bibliographic databases, reference management tools and the application of internationally recognized standards of scientific writing. The course promotes the development of skills in formulating research hypotheses, synthesizing theoretical frameworks and formulating research objectives, preparing students for the next stage of their research work.

(9) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Distance Learning, Cooperation with the supervisor	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	<ul style="list-style-type: none"> • Presentation with the help of slides and interactive material. • LMS course page with supporting and auxiliary material. • Contact by e-mail, Enhanced communication channels of LMS platform, Skype and other teleconference systems meetings. 	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	Activity	Semester workload
	Individual Study	125
	Thesis Writing	125
	Individual project	125
	Course total	187.5
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	All Master Thesis Projects are presented publicly. The details of the preparation, delivery, presentation and evaluation of the MTEs shall be determined by a decision of the Steering Committee. The M.Sc. thesis is publicly supported by a three-member examination committee, appointed by the MSc Coordinating Committee, which includes the supervisor and two (2) other faculty members. The final grade is calculated on the basis of the following evaluation criteria : <ul style="list-style-type: none"> • Scientific Originality and Research Contribution • Structure and organisation of the work • Methodological completeness • Excellence and innovation of the deliverable/educational intervention 	

	<ul style="list-style-type: none">• Analysis and Evaluation of Results• Adherence to Academic Ethics and Use of Literature Sources• Presentation and Support of the Work.
	Grading scale
	Excellent (8-10)
	Very good (6,5-7.99)
	Good (5-6.5)
	Fail (0-4.99)

(10) ATTACHED BIBLIOGRAPHY

<p>-Suggested bibliography:</p> <p>- Transue, B. (2019). <i>Apa style 7th edition</i>.</p> <p>- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... & Moher, D. (2021). <i>The PRISMA 2020 statement: an updated guideline for reporting systematic reviews</i>. <i>bmj</i>, 372.</p> <p>- Related academic journals:</p> <p><i>Virtual Reality</i>, Springer</p> <p><i>International Journal of Human-computer Interaction</i>, Taylor & Francis</p> <p><i>Computers in Human Behaviour</i>, Elsevier</p>

Summer Period

IMTE1: Immersive Storytelling

COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Sciences		
ACADEMIC UNIT	Department of Computer Science		
LEVEL OF STUDIES	Postgraduate, MSc on Immersive Technologies		
COURSE CODE		SEMESTER	Summer Period
COURSE TITLE	IMTE1: Immersive Storytelling		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures		3	
Total			7.5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialised general knowledge Skills development		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English		

IS THE COURSE OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	

(2) LEARNING OUTCOMES

Learning outcomes <i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i> <i>Consult Appendix A</i> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i> 																			
<p>A storyteller's ultimate goal is to fully immerse the audience in the universe of their story, and technology can play an important part when it comes to immersive storytelling. This course takes a close look at the mechanics of immersive storytelling within dynamic media and equips students with tools and technologies to make their story an immersive experience. Students can explore experiential and immersive storytelling in Virtual Reality (VR), Augmented Reality (AR), Mixed Reality and 360 videos.</p> <p>Upon successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe basic concepts of immersive technologies. • Understand the technologies that make stories immersive experiences. • Understand basic principles in storytelling. • Combine various innovative technologies in order to build immersive stories. 																			
General Competences <i>Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?</i> <table border="0"> <tr> <td><i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i></td><td><i>Project planning and management</i></td></tr> <tr> <td><i>Adapting to new situations</i></td><td><i>Respect for difference and multiculturalism</i></td></tr> <tr> <td><i>Decision-making</i></td><td><i>Respect for the natural environment</i></td></tr> <tr> <td><i>Working independently</i></td><td><i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i></td></tr> <tr> <td><i>Team work</i></td><td><i>Criticism and self-criticism</i></td></tr> <tr> <td><i>Working in an international environment</i></td><td><i>Production of free, creative and inductive thinking</i></td></tr> <tr> <td><i>Working in an interdisciplinary environment</i></td><td><i>.....</i></td></tr> <tr> <td><i>Production of new research ideas</i></td><td><i>Others...</i></td></tr> <tr> <td></td><td><i>.....</i></td></tr> </table>		<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>	<i>Adapting to new situations</i>	<i>Respect for difference and multiculturalism</i>	<i>Decision-making</i>	<i>Respect for the natural environment</i>	<i>Working independently</i>	<i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>	<i>Team work</i>	<i>Criticism and self-criticism</i>	<i>Working in an international environment</i>	<i>Production of free, creative and inductive thinking</i>	<i>Working in an interdisciplinary environment</i>	<i>.....</i>	<i>Production of new research ideas</i>	<i>Others...</i>		<i>.....</i>
<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>																		
<i>Adapting to new situations</i>	<i>Respect for difference and multiculturalism</i>																		
<i>Decision-making</i>	<i>Respect for the natural environment</i>																		
<i>Working independently</i>	<i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>																		
<i>Team work</i>	<i>Criticism and self-criticism</i>																		
<i>Working in an international environment</i>	<i>Production of free, creative and inductive thinking</i>																		
<i>Working in an interdisciplinary environment</i>	<i>.....</i>																		
<i>Production of new research ideas</i>	<i>Others...</i>																		
	<i>.....</i>																		

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Working independently

Team work

Project planning and management

Production of new research ideas

(3) SYLLABUS

The content of the course includes:

1. Traditional narrative
2. Introductory concepts of the technology behind storytelling
3. Storytelling principles for immersive space
4. Designing an immersive narrative
5. Sound design
6. Visual Montage
7. Codifying story elements
8. Combining technologies for immersive storytelling

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Distance Learning (synchronous and asynchronous)	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	<ul style="list-style-type: none"> • Presentation with the help of slides. • Website of the course with supporting and auxiliary material. • Contact by e-mail, or Skype. 	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	Activity	Semester workload
	Lectures	39
	Tutorial Exercises: Practical implementation of designing and building immersive storytelling experiences in various programming environments.	39
	Individual or team project	55
	Individual Study	54.5
	Course total	187.5
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i>		

<p><i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<p>Final mark is calculated based on the following:</p> <ul style="list-style-type: none"> • (20%) High-quality contributions to the Discussions • (80%) Written essays-reports/ Individual or Group Projects (or any combination)
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(5) ATTACHED BIBLIOGRAPHY

<p>- <i>Suggested bibliography:</i></p> <p>- <i>Related academic journals:</i></p> <ul style="list-style-type: none"> • Kelly McErlean, "Interactive Narratives and Transmedia Storytelling", 1st Edition, Routledge, 2018, ISBN-10: 113863882X. • John Bucher, "Storytelling for Virtual Reality", 1st Edition, Routledge, 2017, ISBN-10: 1138629669. • Elmezeny, Ahmed, Nina Edenhofer, and Jeffrey Wimmer. "Immersive storytelling in 360-degree videos: An analysis of interplay between narrative and technical immersion." Journal For Virtual Worlds Research 11.1 (2018). • Carolyn Handler Miller, "Digital Storytelling 4e: A creator's guide to interactive entertainment", CRC Press, 2019. International Journal of Virtual and Augmented Reality (IGI Global).

IMTE2: Immersive Experiences and Technologies
COURSE OUTLINE
(1) GENERAL

SCHOOL	School of Sciences		
ACADEMIC UNIT	Department of Computer Science		
LEVEL OF STUDIES	Postgraduate, MSc on Immersive Technologies		
COURSE CODE		SEMESTER	Summer Period
COURSE TITLE	IMTE2: Immersive Experiences and Technologies		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures		3	
Total			7.5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialised general knowledge Skills development		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)			

(2) LEARNING OUTCOMES
Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A																			
<ul style="list-style-type: none"> • Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area • Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B • Guidelines for writing Learning Outcomes 																			
<p>The boundaries between the digital and the physical continue to blur and new kinds of immersive interactions become possible. Augmented reality, virtual reality and mixed reality can create experiences that flow freely across real and virtual spaces. This course takes a close look at the mechanics of immersive storytelling within dynamic media and equips students with tools and technologies to make their story an immersive experience. Students can explore experiential and immersive storytelling in Virtual Reality (VR), Augmented Reality (AR), Mixed Reality and 360 videos.</p> <p>Upon successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe basic technologies used in building immersive experiences. • Describe the basic elements of Immersion. • Understand basic principles of immersive environments. 																			
General Competences <p><i>Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?</i></p> <table> <tr> <td><i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i></td><td><i>Project planning and management</i></td></tr> <tr> <td><i>Adapting to new situations</i></td><td><i>Respect for difference and multiculturalism</i></td></tr> <tr> <td><i>Decision-making</i></td><td><i>Respect for the natural environment</i></td></tr> <tr> <td><i>Working independently</i></td><td><i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i></td></tr> <tr> <td><i>Team work</i></td><td><i>Criticism and self-criticism</i></td></tr> <tr> <td><i>Working in an international environment</i></td><td><i>Production of free, creative and inductive thinking</i></td></tr> <tr> <td><i>Working in an interdisciplinary environment</i></td><td><i>.....</i></td></tr> <tr> <td><i>Production of new research ideas</i></td><td><i>Others...</i></td></tr> <tr> <td></td><td><i>.....</i></td></tr> </table>		<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>	<i>Adapting to new situations</i>	<i>Respect for difference and multiculturalism</i>	<i>Decision-making</i>	<i>Respect for the natural environment</i>	<i>Working independently</i>	<i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>	<i>Team work</i>	<i>Criticism and self-criticism</i>	<i>Working in an international environment</i>	<i>Production of free, creative and inductive thinking</i>	<i>Working in an interdisciplinary environment</i>	<i>.....</i>	<i>Production of new research ideas</i>	<i>Others...</i>		<i>.....</i>
<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>																		
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<i>Production of new research ideas</i>	<i>Others...</i>																		
	<i>.....</i>																		
<p>Search for, analysis and synthesis of data and information, with the use of the necessary technology</p> <p>Working independently</p> <p>Team work</p> <p>Project planning and management</p> <p>Production of new research ideas</p>																			

(3) SYLLABUS

The content of the course includes:

1. The Elements of Immersion
2. Popular Virtual and Augmented Reality Technology
3. Limitations of immersive environments
4. Applications of immersive experiences

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Distance Learning (synchronous and asynchronous)	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	<ul style="list-style-type: none"> • Presentation with the help of slides. • Website of the course with supporting and auxiliary material. • Contact by e-mail, or Skype. 	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	Activity	Semester workload
	Lectures	39
	Tutorial Exercises: Evaluation of Immersive Experiences.	39
	Individual or team project	40
	Individual Study	54.5
	Course total	187.5
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i> <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	Final mark is calculated based on the following: <ul style="list-style-type: none"> • (20%) High-quality contributions to the Discussions • (80%) Written essays-reports/ Individual or Group Projects (or any combination) 	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- Related academic journals:

- Kelly McErlean, "Immersive Technology A Complete Guide - 2019 Edition", 5STARCook, 2019.
- John Bucher, "Storytelling for Virtual Reality", 1st Edition, Routledge, 2017, ISBN-10: 1138629669.
- Pierre (Pete) Routhier, "Immersive Technologies", Blurb, 2019.
- Suh, Ayoung, and Jane Prophet. "The state of immersive technology research: A literature analysis." Computers in Human Behavior 86 (2018): 77-90.

IMTE3: Digital Innovative Industries and Media Marketing
COURSE OUTLINE
(1) GENERAL

SCHOOL	School of Sciences		
ACADEMIC UNIT	Department of Computer Science		
LEVEL OF STUDIES	Postgraduate, MSc on Immersive Technologies		
COURSE CODE		SEMESTER	Summer Period
COURSE TITLE	IMTE3: Digital Innovative Industries and Media Marketing		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures		3	
Total			7.5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE	Specialised general knowledge		
<i>general background, special background, specialised general knowledge, skills development</i>	Skills development		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)			

(2) LEARNING OUTCOMES
Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

<p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i> 																			
<p>Virtual Reality (VR) and Augmented Reality (AR) have changed the playing field dramatically for marketing, branding, and public relations professionals. This course provides the basic communication tools in order to engage effectively with the target audience with the use of VR and AR technology.</p> <p>Upon successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Understand, create, and manage successful VR and AR campaigns • Transform a campaign using innovative technologies • Suggest digital innovation solutions to transform organisations • Apply digital innovation frameworks to enhance strategy and competitiveness 																			
<p>General Competences</p> <p><i>Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?</i></p> <table> <tr> <td><i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i></td><td><i>Project planning and management</i></td></tr> <tr> <td><i>Adapting to new situations</i></td><td><i>Respect for difference and multiculturalism</i></td></tr> <tr> <td><i>Decision-making</i></td><td><i>Respect for the natural environment</i></td></tr> <tr> <td><i>Working independently</i></td><td><i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i></td></tr> <tr> <td><i>Team work</i></td><td><i>Criticism and self-criticism</i></td></tr> <tr> <td><i>Working in an international environment</i></td><td><i>Production of free, creative and inductive thinking</i></td></tr> <tr> <td><i>Working in an interdisciplinary environment</i></td><td><i>.....</i></td></tr> <tr> <td><i>Production of new research ideas</i></td><td><i>Others...</i></td></tr> <tr> <td></td><td><i>.....</i></td></tr> </table>		<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>	<i>Adapting to new situations</i>	<i>Respect for difference and multiculturalism</i>	<i>Decision-making</i>	<i>Respect for the natural environment</i>	<i>Working independently</i>	<i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>	<i>Team work</i>	<i>Criticism and self-criticism</i>	<i>Working in an international environment</i>	<i>Production of free, creative and inductive thinking</i>	<i>Working in an interdisciplinary environment</i>	<i>.....</i>	<i>Production of new research ideas</i>	<i>Others...</i>		<i>.....</i>
<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>																		
<i>Adapting to new situations</i>	<i>Respect for difference and multiculturalism</i>																		
<i>Decision-making</i>	<i>Respect for the natural environment</i>																		
<i>Working independently</i>	<i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>																		
<i>Team work</i>	<i>Criticism and self-criticism</i>																		
<i>Working in an international environment</i>	<i>Production of free, creative and inductive thinking</i>																		
<i>Working in an interdisciplinary environment</i>	<i>.....</i>																		
<i>Production of new research ideas</i>	<i>Others...</i>																		
	<i>.....</i>																		
<p>Search for, analysis and synthesis of data and information, with the use of the necessary technology</p> <p>Working independently</p> <p>Team work</p> <p>Project planning and management</p> <p>Production of new research ideas</p>																			

(3) SYLLABUS

The content of the course includes:

1. Business Process Innovation

2. Product Innovation and Design
3. Product launch strategy in the Digital Age
4. Digital Media and Innovation
5. Tools for enhancing strategy and competitiveness
6. Transition to the digital age

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Distance Learning (synchronous and asynchronous)	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	<ul style="list-style-type: none"> • Presentation with the help of slides. • Website of the course with supporting and auxiliary material. • Contact by e-mail, or Skype. 	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	Activity	Semester workload
	Lectures	39
	Tutorial Exercises: Practical implementation of designing immersive media.	39
	Individual or team project	55
	Individual Study	54.5
	Course total	187.5
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i> <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	Final mark is calculated based on the following: <ul style="list-style-type: none"> • (20%) High-quality contributions to the Discussions • (80%) Written essays-reports/ Individual or Group Projects (or any combination) 	

(5) ATTACHED BIBLIOGRAPHY

- *Suggested bibliography:*

- *Related academic journals:*

- Cathy Hackl, Samantha G. Wolfe, "Marketing New Realities: An Introduction to Virtual Reality & Augmented Reality Marketing, Branding, & Communications", Meraki Press, 2017, ISBN-10: 0996510672.
- Richard A. Gershon, "Digital Media and Innovation: Management and Design Strategies in Communication", 1st Edition, 2016, ISBN-10: 1452241414

IMTE4: Immersive Media Design Courses

COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Sciences		
ACADEMIC UNIT	Department of Computer Science		
LEVEL OF STUDIES	Postgraduate, MSc on Immersive Technologies		
COURSE CODE		SEMESTER	Summer Period
COURSE TITLE	IMTE4: Immersive Media Design Courses		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures		3	
Total			7.5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialised general knowledge Skills development		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)			

(2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Immersive Media is a category of media that effectively surrounds, or immerses, its audience. Rather than simply “watch” immersive media, participants often feel that they “experience” content. This course provides students with in-depth learning experiences, thorough instruction, and an understanding of theories, techniques and skills employed in designing immersive media content.

Upon successful completion of the course, students will be able to:

- Describe basic concepts of immersive media content.
- Design with various tools, immersive media content.
- To transform data into meaningful social and emotional communication using innovative technologies.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management
Adapting to new situations	Respect for difference and multiculturalism
Decision-making	Respect for the natural environment
Working independently	Showing social, professional and ethical responsibility and sensitivity to gender issues
Team work	Criticism and self-criticism
Working in an international environment	Production of free, creative and inductive thinking
Working in an interdisciplinary environment
Production of new research ideas	Others...

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Working independently

Team work

Project planning and management

Production of new research ideas

(3) SYLLABUS

The content of the course includes:

1. Audio in Interactive and Immersive Environments
2. Video in Interactive and Immersive Environments
3. Image in Interactive and Immersive Environments
4. Designing an immersive experience
5. Limitations on designing media for immersive experiences
6. Compression of media
7. Combining media to create immersive experiences

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Distance Learning (synchronous and asynchronous)	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	<ul style="list-style-type: none"> • Presentation with the help of slides. • Website of the course with supporting and auxiliary material. • Contact by e-mail, or Skype. 	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	Activity	Semester workload
	Lectures	39
	Lab Exercises: Practical implementation of designing immersive media.	39
	Individual or team project	40
	Individual Study	54.5
	Course total	187.5
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i> <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	Final mark is calculated based on the following: <ul style="list-style-type: none"> • (20%) High-quality contributions to the Discussions • (80%) Written essays-reports/ Individual or Group Projects (or any combination) 	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- Related academic journals:

- Jean-Luc Sinclair, "Principles of Game Audio and Sound Design: Sound Design and Audio Implementation for Interactive and Immersive Media", 1st Edition, Routledge, 2020, ISBN-10: 1138738964.
- Kenneth C.C. Yang, "Cases on Immersive Virtual Reality Techniques (Advances in Multimedia and Interactive Technologies", 1st Edition, IGI Global, 2019, ISBN-10: 1522559124.
- Chris Dede, "Immersive interfaces for engagement and learning." science 323.5910 (2009): 66-69.
- Stephen C. Bronack, "The role of immersive media in online education." The Journal of Continuing Higher Education 59.2 (2011): 113-117.

MTP2: MSc Thesis Project Part II
COURSE OUTLINE
(11) GENERAL

SCHOOL	School of Sciences		
ACADEMIC UNIT	Department of Computer Science		
LEVEL OF STUDIES	Postgraduate, MSc on Immersive Technologies		
COURSE CODE		SEMESTER	Summer Period
COURSE TITLE	MTP2: MSc Thesis Project Part II		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
Total			15
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialised general knowledge, Skills development		
PREREQUISITE COURSES:	IMTC1, IMTC2, IMTC3, IMTC4, MTP1		

LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	

(12) LEARNING OUTCOMES

Learning outcomes <i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i> <i>Consult Appendix A</i> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i> 																			
<p>Upon successful completion of the Master's thesis, participants will be able to:</p> <ul style="list-style-type: none"> • Develop and document a prototype or technological solution within the context of their MSc. • Design and implement educational or technological interventions based on research evidence. • Conduct an evaluation of the intervention using appropriate methodological approaches. • Analyse and interpret the results of the implementation of their project. • Synthesise their research findings into a final report that meets academic criteria. • Present and defend their work before an examination board. • The course concludes with the submission of the final dissertation and its oral support, where students are required to argue for their research approach, the methodology followed and the results produced. 																			
General Competences <i>Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?</i> <table> <tr> <td><i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i></td><td><i>Project planning and management</i></td></tr> <tr> <td><i>Adapting to new situations</i></td><td><i>Respect for difference and multiculturalism</i></td></tr> <tr> <td><i>Decision-making</i></td><td><i>Respect for the natural environment</i></td></tr> <tr> <td><i>Working independently</i></td><td><i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i></td></tr> <tr> <td><i>Team work</i></td><td><i>Criticism and self-criticism</i></td></tr> <tr> <td><i>Working in an international environment</i></td><td><i>Production of free, creative and inductive thinking</i></td></tr> <tr> <td><i>Working in an interdisciplinary environment</i></td><td><i>.....</i></td></tr> <tr> <td><i>Production of new research ideas</i></td><td><i>Others...</i></td></tr> <tr> <td></td><td><i>.....</i></td></tr> </table>		<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>	<i>Adapting to new situations</i>	<i>Respect for difference and multiculturalism</i>	<i>Decision-making</i>	<i>Respect for the natural environment</i>	<i>Working independently</i>	<i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>	<i>Team work</i>	<i>Criticism and self-criticism</i>	<i>Working in an international environment</i>	<i>Production of free, creative and inductive thinking</i>	<i>Working in an interdisciplinary environment</i>	<i>.....</i>	<i>Production of new research ideas</i>	<i>Others...</i>		<i>.....</i>
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<i>Working in an interdisciplinary environment</i>	<i>.....</i>																		
<i>Production of new research ideas</i>	<i>Others...</i>																		
	<i>.....</i>																		

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Working independently

Project planning and management

Production of new research ideas

Promoting free, creative and inductive thinking

(13) SYLLABUS

The course is the second and final part of the Master's Thesis (M.Sc.), focusing on the development of an original project and its implementation through educational or technological intervention. The aim of the course is to guide students in the implementation of their research proposal, which may include the creation of a new methodology, software, tool or application, and the evaluation of its effectiveness in real or simulated environments.

Students are required to turn their theoretical research into a tangible outcome, test their intervention in an educational, professional or research context and analyse the data resulting from its application. Particular emphasis is placed on evaluating the prototype, analysing the results and drawing conclusions that contribute to improving scientific knowledge and the practical application of the technologies studied.

The course concludes with the submission of the final thesis and its oral support, where students are invited to argue for their research approach, the methodology followed and the results produced.

(14) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Distance Learning, Cooperation with the supervisor	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	<ul style="list-style-type: none"> • Presentation with the help of slides and interactive material. • LMS course page with supporting and auxiliary material. • Contact by e-mail, Enhanced communication channels of LMS platform, Skype and other teleconference systems meetings. 	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	Activity	Semester workload
	Individual Study	125
	Thesis Writing	125
	Individual project	125
	Course total	187.5

<p>STUDENT PERFORMANCE EVALUATION</p> <p>Description of the evaluation procedure</p> <p>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</p> <p>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</p>	<p>All Master Thesis Projects are presented publicly. The details of the preparation, delivery, presentation and evaluation of the MTEs shall be determined by a decision of the Steering Committee.</p> <p>The M.Sc. thesis is publicly supported by a three-member examination committee, appointed by the MSc Coordinating Committee, which includes the supervisor and two (2) other faculty members.</p> <p>The final grade is calculated on the basis of the following evaluation</p> <p>Evaluation criteria :</p> <ul style="list-style-type: none"> • Scientific Originality and Research Contribution • Structure and organisation of the work • Methodological completeness • Excellence and innovation of the deliverable/educational intervention • Analysis and Evaluation of Results • Adherence to Academic Ethics and Use of Literature Sources • Presentation and Support of the Work. <p>Grading scale</p> <p>Excellent (8-10)</p> <p>Very good (6,5-7.99)</p> <p>Good (5-6.5)</p> <p>Fail (0-4.99)</p>
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(15) ATTACHED BIBLIOGRAPHY

<p>- <i>Suggested bibliography:</i></p> <p>- <i>Transue, B. (2019). Apa style 7th edition.</i></p> <p>- <i>Related academic journals:</i></p> <p><i>Virtual Reality, Springer</i></p> <p><i>International Journal of Human-computer Interaction, Taylor & Francis</i></p> <p><i>Computers in Human Behaviour, Elsevier</i></p>

IS: Independent Study

COURSE OUTLINE

(16) GENERAL

SCHOOL	School of Sciences		
ACADEMIC UNIT	Department of Computer Science		
LEVEL OF STUDIES	Postgraduate, MSc on Immersive Technologies		
COURSE CODE		SEMESTER	Summer Period
COURSE TITLE	MTP2: MSc Thesis Project Part II		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
			15
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialised general knowledge, Skills development		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)			

(17) LEARNING OUTCOMES

Learning outcomes	
<i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i>	
<i>Consult Appendix A</i>	
<ul style="list-style-type: none">• <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i>• <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i>• <i>Guidelines for writing Learning Outcomes</i>	
Upon successful completion of the Master's thesis, participants will be able to:	
<ul style="list-style-type: none">• Develop and document a prototype or technological solution within the context of their MSc.• Design and implement educational or technological interventions based on research evidence.• Conduct an evaluation of the intervention using appropriate methodological approaches.• Analyse and interpret the results of the implementation of their project.• Synthesise their research findings into a final report that meets academic criteria.• The course concludes with the submission of the final dissertation and its oral support, where students are required to argue for their research approach, the methodology followed and the results produced.	
General Competences	
<i>Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?</i>	
<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>
<i>Adapting to new situations</i>	<i>Respect for difference and multiculturalism</i>
<i>Decision-making</i>	<i>Respect for the natural environment</i>
<i>Working independently</i>	<i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>
<i>Team work</i>	<i>Criticism and self-criticism</i>
<i>Working in an international environment</i>	<i>Production of free, creative and inductive thinking</i>
<i>Working in an interdisciplinary environment</i>
<i>Production of new research ideas</i>	<i>Others...</i>

Search for, analysis and synthesis of data and information, with the use of the necessary technology	
Working independently	
Project planning and management	
Production of new research ideas	
Promoting free, creative and inductive thinking	

(18) SYLLABUS

The Independent Study course provides students with the opportunity to conduct an independent, in-depth literature research on a specialized topic related to the subject of the MSc. Independent Study focuses on the collection, analysis and synthesis of contemporary scientific literature, with the aim of understanding the theoretical and methodological approaches that have been developed in the specific scientific field.

Students, under the guidance of a faculty member, develop critical thinking, evaluate existing research papers, identify gaps in the literature, and propose new research directions. At the end of the course, they produce a documented academic paper, which can form the basis for further research or for the development of a future thesis.

The course promotes students' academic independence, the development of literature review skills and the application of academic writing and documentation standards.

(19) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Distance Learning, Cooperation with the supervisor	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	<ul style="list-style-type: none"> • Presentation with the help of slides and interactive material. • LMS course page with supporting and auxiliary material. • Contact by e-mail, Enhanced communication channels of LMS platform, Skype and other teleconference systems meetings. 	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	Activity	Semester workload
	Individual Study	125
	Thesis Writing	125
	Individual project	125
	Course total	187.5

<p>STUDENT PERFORMANCE EVALUATION</p> <p>Description of the evaluation procedure</p> <p>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</p> <p>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</p>	<p>All Independent Studies are implemented and submitted for scoring by the supervisor.</p> <p>The final grade shall be calculated based on the following Evaluation criteria :</p> <ul style="list-style-type: none"> - Scientific Originality and Research Contribution - Structure and organisation of the work - Methodological completeness - Analysis and evaluation of results - Adherence to Academic Ethics and Use of Bibliographic Sources <p>Grading scale</p> <p>Excellent (8-10)</p> <p>Very good (6,5-7.99)</p> <p>Good (5-6.5)</p> <p>Fail (0-4.99)</p>
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(20) ATTACHED BIBLIOGRAPHY

<p>- <i>Suggested bibliography:</i></p> <ul style="list-style-type: none"> • Transue, B. (2019). Apa style 7th edition. • Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... & Moher, D. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. <i>bmj</i>, 372

Η απόφαση αυτή με το συνημμένο αρχείο να δημοσιευθεί στην Εφημερίδα της Κυβερνήσεως.

Κομοτηνή, 16 Ιουνίου 2025

Ο Πρύτανης

ΦΩΤΙΟΣ ΜΑΡΗΣ