



ARCL0119: Forensic Anthropology

MSc Core Module: 15 credits

Turnitin Class ID: 3884658

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Deadlines for coursework for this module: 18th January 2019

Target dates for return of marked coursework to students: 18th February 2019

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INTRODUCTION:

This course focuses on introducing students to the basic techniques and theory that form the framework of Forensic Anthropology. This will include biological profiling, analysis of trauma, the use of modern records (dental and medical) in identification, and understanding the legal framework in which the forensic anthropologist works. Further aims of this course are to provide students with a solid background in the function and role of forensic anthropological skills in both small scale forensic death inquiries and in larger mass-disaster events.

WEEK-BY-WEEK SUMMARY

	LECTURE: Tuesdays 11.00-13.00, Room 209	PRACTICAL: FRIDAYS; 2hr session between 10.00 – 17.00
WEEK 1	Introduction to Forensic Anthropology Introduction to Biological Profiling & Sexual Dimorphism	Biological Profiling 1: Sex Estimation
WEEK 2	Growth, Development and Senescence	Biological Profiling 2: Age Estimation
WEEK 3	Measurements, Stature & BMI	Biological Profiling 3: Taking measurements; Stature Estimation; Revision
WEEK 4	Understanding Race: Ancestry & Anthropology	Biological Profiling 4: Ancestry Estimation
WEEK 5	Introduction to Trauma Analysis	Trauma: Overview + General Revision session (Practice exam)
WEEK 6	Reading Week	No classes
WEEK 7	Blunt Force Trauma: Classification and Biomechanics	Trauma 1: Blunt Force
WEEK 8	Sharp Force Trauma	Trauma 2: Sharp Force
WEEK 9	Ballistic and Projectile Trauma	Trauma 3: Gun Shot Wounds + Revision Session
WEEK 10	Ante-mortem Records; Reading CT/Radiographs	EXAM
WEEK 11	Dealing with Disaster & Disaster Victim Identification	No class

BASIC TEXTS

These are intended to provide only the most basic of introductions to the various topics discussed during lectures and seminars. A more comprehensive reading list for each week of the course is provided later in this handbook, however this is not exhaustive and it is expected that each student will expand upon these provided articles in their own time.

-Buikstra, J. and Ubelaker, D. (eds), 1994. *Standards for Data Collection from Human Skeletal Remains*. Arkansas: Archaeological Survey Research Series No 44. **INST ARCH JF BUI**

-Dirkmaat, D.C. (Ed), 2012. *A companion to forensic anthropology*. Chichester: Wiley-Blackwell. **INST ARCH JF DIR**

-Blau, S., and Ubelaker, D. (eds), 2009. *Handbook of Forensic Anthropology and Archaeology*. Walnut Creek, California: Left Coast Press. **INST ARCH JF BLA**

-Byers, S., 2008. *Introduction to forensic anthropology (3/E)*. London: Pearson. **INST ARCH JF BYE**

-Rathburn, T., A. and Buikstra, J., E. (eds), 1984. *Human identification: case studies in forensic anthropology*. Springfield, IL: Charles C Thomas. **INST ARCH JF RAT**

-Fairgrieve, S. (ed), 1999. *Forensic osteological analysis*. Illinois: Charles C Thomas. **INST ARCH JF FAI**

-Galloway, A. (ed), 1999. *Broken bones: anthropological analysis of blunt force trauma*. Springfield, IL: Charles C Thomas. **INST ARCH JF GAL**

-Burns, K., 2007. **Forensic anthropology training manual (2/E)**. Upper Saddle River, NJ: Pearson. **INST ARCH BB2 BUR**

-Reichs, K. (ed), 1998. *Forensic Osteology*. Springfield, IL: Charles C Thomas. **INST ARCH BB1 REI**

-Schmitt, A., Cunha, E., and Pinheiro, J. (eds) 2006. *Forensic anthropology and medicine*. Totowa, NJ: Humana Press. **INST ARCH JF SCH**

-Tersigni-Tarrant, M. and Shirley, N., 2011. *Forensic Anthropology*. Boca Raton: CRC Press. **INST ARCH JF TER**

-Wagner, S., 2004. *Color atlas of the autopsy*. Boca Raton: CRC Press. **INST ARCH JF WAG**

-Steadman, D.W., 2003. *Hard Evidence: Case studies in forensic anthropology*. Upper Saddle River, NJ: Prentice Hall. **INST ARCH JF STE**

-Cox, M., Flavel, A., Hanson, I., Laver, J., and Wessling, R., 2008. *The Scientific Investigation of Mass Graves: Towards Protocols and Standard Operating Procedures*. Cambridge: Cambridge University Press. **INST ARCH JF COX**

-Adams, B., and Byrd, J. (eds), 2008. *Recovery, Analysis, and Identification of Commingled Human Remains*. Towata, New Jersey: Humana Press. **INST ARCH JF ADA**

RELEVANT JOURNALS

-American Journal of Physical Anthropology

-FBI Bulletin (<http://www.fbi.gov/publications/leb/leb.htm>)

-Forensic Science International

-Journal of Forensic Dental Science

-Journal of Forensic and Legal Medicine

-Journal of Forensic Sciences

-Journal of Trauma and Acute Care Surgery

-International Journal of Burns and Trauma

-JAMA (Journal of the American Medical Association)

-Science and Justice

-American Journal of Forensic Medicine and Pathology

METHODS OF ASSESSMENT

This course is assessed by means of:

- (a) one essay of 2500 (range between **2375 - 2625**) words, which will contribute **60%** to the final grade for the course. This is due on the **18th of January, 2019**.
- (b) one practical examination, to be held on **FRIDAY 7th December 2018**, which will contribute **40%** to the final grade for the course

TEACHING METHODS

The course is taught through lectures and practical sessions. All lectures will be held on **TUESDAYS** in room **209 of the Institute from 11.00 – 13.00**. Practical sessions will be held on **FRIDAYS** from **10.00 – 17.00** (students will be assigned one of three sessions which run 2 hours each) and are compulsory (all practicals will be held in room 308).

WORKLOAD

There will be 22 hours of lectures and 22 hours of practical sessions for this course. Students will be expected to undertake around 45 hours of reading for the course, plus 45 hours preparing for and producing the assessed work, and an additional 10 hours on revision for the examination. This adds up to a total workload of some 150 hours for the course.

PREREQUISITES

A good understanding of human osteology is required for this course.

AIMS, OBJECTIVES AND ASSESSMENT

Aims

The primary aim of this course is to introduce students to the wide range of circumstances whereby a Forensic Anthropologist is required. In addition, further aims of this course are as follows: to provide students with a solid background in the function and role of forensic anthropological skills at the scene and in the lab; to introduce students to the analysis and interpretation of trauma; to provide students with the basic legal framework in which the forensic anthropologist works; and introduce students to mass fatality incidents and the role of the forensic anthropologist therein.

Objectives

On successful completion of this course a student should:

- fully understand the varied role of the Forensic Anthropologist
- know what is expected of them at both the scene and the morgue/mortuary
- understand the importance of working within a multidisciplinary team
- recognise when the skills of human identification can assist in crime investigation
- have an understanding the limitations of profiling human remains
- have the ability to problem solve efficiently when confronted with human remains

Learning Outcomes

On successful completion of the course students should be able to demonstrate general skills of observation and inference, critical reflection, and the application of acquired knowledge.

Coursework

Assessment tasks

This course is assessed by means of an essay and practical examination. The titles (topic) for the essay will be provided in the first few weeks of term; student must ordinarily select one of these. Students may, if desired, choose to set their own title, but this must be agreed by the course co-ordinator before any writing begins.

Submission dates

Essay #1 – Must be submitted on or before the **18th of JANUARY 2019**, with a hardcopy handed in by 5pm. If students are unclear about the nature of an assignment, they should discuss this with the Course Co-ordinator.

Students are not permitted to re-write and re-submit essays in order to try to improve their marks. However, students may be permitted, in advance of the deadline for a given assignment, to submit for comment a brief outline of the assignment. The course co-ordinator is willing to discuss an outline of the student's approach to the assignment, provided this is planned suitably in advance of the submission date.

Please note that in order to be deemed to have completed and passed in any module, it is necessary to submit ***all assessments***.

Word counts [For this essay: 2500 (range between **2375 – 2625**)]

The following should ***not*** be included in the word-count: title page, contents pages, lists of figure and tables, abstract, preface, acknowledgements, bibliography, lists of references, captions and contents of tables and figures, appendices.

Penalties will only be imposed if you exceed the upper figure in the range. There is no penalty for using fewer words than the lower figure in the range: the lower figure is simply for your guidance to indicate the sort of length that is expected.

In the 2018-2019 session penalties for over-length work will be as follows:

- For work that exceeds the specified maximum length by less than 10% the mark will be reduced by five percentage marks, but the penalised mark will not be reduced below the pass mark, assuming the work merited a Pass.
- For work that exceeds the specified maximum length by 10% or more the mark will be reduced by ten percentage marks, but the penalised mark will not be reduced below the pass mark, assuming the work merited a Pass.

Coursework submission procedures

- All coursework must normally be submitted both as hard copy and electronically. (The only exceptions are bulky portfolios and lab books which are normally submitted as hard copy only.)
- You should staple the appropriate colour-coded IoA coversheet (available in the IoA library and outside room 411a) to the front of each piece of work and submit it to the red box at the Reception Desk (or room 411a in the case of Year 1 undergraduate work)
- All coursework should be uploaded to Turnitin **by midnight** on the day of the deadline. This will date-stamp your work. It is essential to upload all parts of your work as this is sometimes the version that will be marked.
- Instructions are given below.

Note that Turnitin uses the term 'class' for what we normally call a 'module'.

1. Ensure that your essay or other item of coursework has been saved as a Word doc., docx. or PDF document, and that you have the Class ID for the course (available from the course handbook) and enrolment password (this is IoA1718 for all courses this session - note that this is capital letter I, lower case letter o, upper case A, followed by the current academic year)
2. Click on http://www.turnitinuk.com/en_gb/login
3. Click on 'Create account'
4. Select your category as 'Student'
5. Create an account using your UCL email address. Note that you will be asked to specify a new password for your account - do not use your UCL password or the enrolment password, but invent one of your own (Turnitin will permanently associate this with your account, so you will not have to change it every 6 months, unlike your UCL password). In addition, you will be asked for a "Class ID" and a "Class enrolment password" (see point 1 above).
6. Once you have created an account you can just log in at http://www.turnitinuk.com/en_gb/login and enrol for your other classes without going through the new user process again. Simply click on 'Enrol in a class'. Make sure you have all the relevant "class IDs" at hand.
7. Click on the course to which you wish to submit your work.
8. Click on the correct assignment (e.g. Essay 1).
9. Double-check that you are in the correct course and assignment and then click 'Submit'
10. Attach document as a "Single file upload"
11. Enter your name (the examiner will not be able to see this)
12. Fill in the "Submission title" field with the right details: It is essential that the first word in the title is your examination candidate number (e.g. YGBR8 In what sense can culture be said to evolve?),
13. Click "Upload". When the upload is finished, you will be able to see a text-only version of your submission.
14. Click on "Submit"

If you have problems, please email the IoA Turnitin Advisers on ioa-turnitin@ucl.ac.uk, explaining the nature of the problem and the exact course and assignment involved.

One of the Turnitin Advisers will normally respond within 24 hours, Monday-Friday during term. Please be sure to email the Turnitin Advisers if technical problems prevent you from uploading work in time to meet a submission deadline - even if you do not obtain an immediate response from one of the Advisers they will be able to notify the relevant Course Coordinator that you had attempted to submit the work before the deadline

SCHEDULE AND SYLLABUS

Teaching schedule

Lectures will be held **11.00 – 13.00 on Tuesdays in Room 209**. Practical sessions will be held from **10.00 – 17.00 on Fridays in room 308** (students will be assigned to one two-hour session).

Practical Groups

Students will be divided into groups for practical sessions (Fridays, one 2-hr session between 10.00 – 17.00), which will take place in room 308.

To keep practical groups small enough for effective discussion and learning, *it is essential that students attend the group to which they have been assigned*. If they need to attend a different group for a particular session, they should arrange to swap with another student from that group, and confirm this arrangement with the Course Co-ordinator.

Syllabus

The following is an outline for the course as a whole, and identifies essential readings relevant to each session. Information is provided as to where in the UCL library system individual readings are available; their location and Teaching Collection (TC) number, and status (whether out on loan) can also be accessed on the eUCLid computer catalogue system.

Week 1: 2nd October 2018

Introduction to Forensic Anthropology; Biological Profiling; Sexual Dimorphism in the skeleton

Essential Readings:

- Grivas, C. R., and Komar, D.A., 2008. Kumho, Daubert, and the nature of scientific inquiry: Implications for forensic anthropology. *Journal of Forensic Sciences*, **53**(4): 771-776.
- Garvin, H. M., Sholts, S. B. and Mosca, L. A. (2014), Sexual dimorphism in human cranial trait scores: Effects of population, age, and body size. *American Journal of Physical Anthropology*. 154: 259-269.
- Best, K. C., Garvin, H. M. and Cabo, L. L. 2018. An Investigation into the Relationship between Human Cranial and Pelvic Sexual Dimorphism. *Journal of Forensic Science*, 63: 990-1000.
- Brůžek J. 2002. A method for visual determination of sex, using the human hip bone. *American Journal of Physical Anthropology*. 117:157–168.
- Kranioti, E.F., and Paine, R.R., 2011. Forensic anthropology in Europe: An assessment of current status and application. *Journal of Anthropological Sciences*, **89**: 71-92.
- Holobinko, A., 2012. Forensic human identification in the United States and Canada: A review of the law, admissible techniques, and the legal implications of their application in forensic cases. *Forensic Science International*, **222**: 394.e1-394.e13.

Suggested readings:

- Spradley MK, Jantz RL. 2011. Sex estimation in forensic anthropology: skull versus postcranial elements. *Journal of Forensic Science*. 56:289–296.
- Garvin, H. and Kiales, A. 2017. A Validation Study of the Langley et al. (2017) Decision Tree Model for Sex Estimation, *Journal of Forensic Sciences*, 63, 4, 1243-1251.
- Brůžek J, Santos F, Dutailly B, Murail P, Cunha E. 2017. Validation and reliability of the sex estimation of the human os coxae using freely available DSP2 software for bioarchaeology and forensic anthropology. *American Journal of Physical Anthropology*. 164:440–449

- Komar, D.A., 2003. Twenty-seven years of forensic anthropology casework in New Mexico. *Journal of Forensic Sciences*, **48**(3): 1-4.
- Page, M., Taylor, J., and Blenkin, M., 2011. Forensic identification science evidence since Daubert: Part 1- A quantitative analysis of the exclusion of forensic identification science evidence. *Journal of Forensic Sciences*, **56**(5): 1180-1184.
- Komar, D.A., and Grivas, C., 2008. Manufactured populations: What do contemporary reference skeletal collections represent? A comparative study using the Maxwell Museum Documented Collection. *American Journal of Physical Anthropology*, **137**: 224-233.
- Iscan, M.Y., 2001. Global forensic anthropology in the 21st century (editorial). *Forensic Science International*, **117**: 1-6.
- Cattaneo, C., 2007. Forensic anthropology: Developments of a classical discipline in the new millennium. *Forensic Science International*, **165**: 185-193.
- Baraybar, J., 2008. When DNA is not available, can we still identify people? Recommendations for best practice. *Journal of Forensic Sciences*, **53**(3): 533-540.
- Archer, M., Bessed, R., Briggs, C., and Lynch, M., 2005. Social isolation and delayed discovery of bodies in houses: The value of forensic pathology, anthropology, odontology, and entomology in the medico-legal investigation. *Forensic Science International*, **151**: 259-265.
- Grottenthaler, A., 2001. The reliability of forensic osteology – a case in point. *Forensic Science International*, **117**(1-2): 65-72.
- Walker, P.L., 2008. Sexing skulls using discriminant function analysis of visually assessed traits. *American Journal of Physical Anthropology*, **136**: 39-50.
- Haun, S.J., 2000. Brief communication: A study of the predictive accuracy of mandibular ramus flexure as a single morphological indicator of sex in an archaeological sample. *American Journal of Physical Anthropology*, **111**: 429-432.
- Walker, P.L., 2005. Greater sciatic notch morphology: Sex, age, and population differences. *American Journal of Physical Anthropology*, **127**: 385-391.
- Andreasson, H., and Allen, M., 2003. Rapid quantification and sex determination of forensic evidence materials. *Journal of Forensic Sciences*, **48**(6): 1280-1287.
- Williams, B.A., and Rogers, T.L., 2006. Evaluating the accuracy and precision of cranial morphological traits for sex determination. *Journal of Forensic Sciences*, **51**(4): 729-735.

-Rogers, T.L., 2005. Determining the sex of human remains through cranial morphology. *Journal of Forensic Sciences*, **50**: 493-500.

Week 2: 9th October 2018

Growth, Development and Senescence; Estimating Age in the Skeleton

Essential Readings:

- Buckberry, J.L., and Chamberlain, A.T., 2002. Age estimation from the articular surface of the ilium: A revised method. *American Journal of Physical Anthropology*, **119**(3): 213-239.
- Brooks, S.T., and Suchey, J.M., 1990. Skeletal age determination based on the os pubis: A comparison of the Ascaadi-Nemekeri and Suchey-Brooks methods. *Human Evolution*, **5**: 227-238.
- Lovejoy, C. O., Meindl, R. S., Pryzbeck, T. R. and Mensforth, R. P. 1985. Chronological metamorphosis of the auricular surface of the ilium: A new method for the determination of adult skeletal age at death. *American Journal of Physical Anthropology*. 68: 15-28
- Walker, P.L., 2005. Greater sciatic notch morphology: Sex, age, and population differences. *American Journal of Physical Anthropology*, **127**: 385-391.

Suggested Readings:

- Calce SE, Kurki HK, Weston D, Gould L. 2018. Effects of osteoarthritis on age-at-death estimates from the human pelvis. *American Journal of Physical Anthropology*. 167:3–19.
- Garvin, H.M., and Passalacqua, N.V., 2012. Current practices by forensic anthropologists in adult skeletal age estimation. *Journal of Forensic Sciences*, **57**(2): 427-433.
- Yoder, C., Ubelaker, D.H., and Powell, J.F., 2001. Examination of variation in sternal rib end morphology relevant to age assessment. *Journal of Forensic Sciences*, **46**: 223-227.
- Schmitt, A., Murail, P., Cunha, E., and Rouge, D., 2002. Variability of the pattern of aging on the human skeleton: Evidence from bone indicators and implications on age at death estimation. *Journal of Forensic Sciences*, **47**: 1203-1209.

- Stoyanova, D. K., Algee-Hewitt, B. F., Kim, J. and Slice, D. E. 2018. A Study on the Asymmetry of the Human Left and Right Pubic Symphyseal Surfaces Using High-Definition Data Capture and Computational Shape Methods. *Journal of Forensic Science* (online only).

- Lottering, N., Alston-Knox, C. L., MacGregor, D. M., Izatt, M. T., Grant, C. A., Adam, C. J. and Gregory, L. S. 2017. Apophyseal Ossification of the Iliac Crest in Forensic Age Estimation: Computed Tomography Standards for Modern Australian Subadults. *Journal of Forensic Science*, 62: 292-307.
- Muñoz, A., Maestro, N., Benito, M., Sánchez, J.A., Márquez-Grant, N., Trejo, D. and Ríos, L., 2018. Sex and age at death estimation from the sternal end of the fourth rib. Does İşcan's method really work?. *Legal Medicine*, 31, pp.24-29.
- Merritt, C.E., 2015. The influence of body size on adult skeletal age estimation methods. *American Journal of Physical Anthropology*, 156(1), pp.35-57.
- Corron, L., Marchal, F., Condemi, S. and Adalian, P., 2018. A critical review of sub-adult age estimation in biological anthropology: Do methods comply with published recommendations? *Forensic Science International*, 288: 328.e1-328.e9.

Week 3: 16th October 2018

Measurements, Stature & BMI; Estimating height in the skeleton

Essential Readings:

- Trotter, M. and Gleser, G., 1958. A re-evaluation of estimation of stature based on measurements of stature taken during life and of long bones after death. *American Journal of Physical Anthropology*, **16**: 79-123.
 - Lynch, J.J., Brown, C., Palmiotto, A., Maijanen, H. and Damann, F., 2018. Reanalysis of the Trotter Tibia Quandary and its Continued Effect on Stature Estimation of Past-Conflict Service Members. *Journal of Forensic Sciences*. Online Only
 - Raxter, M.H., Auerbach, B.M. and Ruff, C.B., 2006. Revision of the Fully technique for estimating statures. *American Journal of Physical Anthropology*, 130(3), pp.374-384.
- Suggested readings:
- İşcan, M. Y., 2005. Forensic anthropology of sex and body size. *Forensic Science International*, **147**(2), 107-112.

- Pomeroy, E., Mushrif-Tripathy, V., Wells, J.C., Kulkarni, B., Kinra, S. and Stock, J.T., 2018. Stature estimation equations for South Asian skeletons based on DXA scans of contemporary adults. *American Journal of Physical Anthropology*. (Online only)
- Schaffer, W.C. and Dunn, T.E., 2017. Accuracy and Reliability of Total Body Mass Estimation Techniques from Stature and Bi-iliac Breadth in Non-Hispanic US Whites from the Bass Donated Skeletal Collection. *Journal of Forensic Sciences*, 63 (5): 1486-1491.
- Adams, B.J., and Hermann, N.P., 2006. Estimating living stature from selected anthropometric (soft tissue) measurements: How do these compare with osteometric (skeletal) measurements? Proceedings of the American Academy of Forensic Sciences, **12**: 279-280.
- Fawzy, I. A., & Kamal, N. N., 2010. Stature and body weight estimation from various footprint measurements among Egyptian population. *Journal of Forensic Sciences*, **55**(4), 884-888.
- Wilson, R. J., Herrmann, N. P., & Jantz, L. M., 2010. Evaluation of Stature Estimation from the Database for Forensic Anthropology*†. *Journal of Forensic Sciences*, **55**(3), 684-689.
- Krishan, K., Kanchan, T., & Sharma, A., 2012. Multiplication factor versus regression analysis in stature estimation from hand and foot dimensions. *Journal of Forensic and Legal Medicine*, **19**(4), 211-214.
- Brits, D.M., Bidmos, M.A. and Manger, P.R., 2017. Stature estimation from the femur and tibia in Black South African sub-adults. *Forensic Science International*, 270, pp.277-e1.
- Jeanson, A.L., Santos, F., Villa, C., Dupej, J., Lynnerup, N. and Brůžek, J., 2017. Body mass estimation from the skeleton: An evaluation of 11 methods. *Forensic Science International*, 281, pp.183-e1.

Week 4: 23rd October 2018

Understanding Race: Ancestry & Anthropology ; Can we estimate ancestry from the skeleton?

Essential Readings:

- Hefner, J., 2009. Cranial nonmetric variation and estimating ancestry. *Journal of Forensic Sciences*, **54**(4): 985-995.
- Sauer, N.J., 1992. Forensic anthropologists and the concept of race: If races don't exist why are forensic anthropologists so good at identifying them? *Social Science and Medicine*, **34**(2): 107-111.

Suggested readings:

- Byers, S., 2008. *Introduction to forensic anthropology (3/E)*. London: Pearson. **INST ARCH JF BYE** (CHAPTER 7: Attribution of Ancestry)
- Krogman, W.M., and Iscan, M.Y., 1986. *The human skeleton in forensic medicine*. Springfield, IL: Charles C Thomas Publisher. **INST ARCH BB2 KRO** (CHAPTER 7: Assessment of racial affinity)
- Buck, J.L., and Strand Vidarsdottir, U., 2004. A proposed method for the identification of race in sub-adult skeletons: A geometric morphometric analysis of mandibular morphology. *Journal of Forensic Sciences*, **49**: 1159-1164.
- Wescott, D.J., 2005. Population variation in femur subtrochanteric shape. *Journal of Forensic Sciences*, **50**(2): 286-293.
- Bamshad, M., Wooding, S., Salisbury, B.A., and Stephens, J.C., 2004. Deconstructing the relationship between genetics and race. *Nature Reviews Genetics*, **5**: 598-609.
- Relethford, J.H., 2004. Boas and beyond: Migration and craniometric variation. *American Journal of Human Biology*, **16**: 379-386.
- Hughes, C., Juarez, C., Hughes, T., Galloway, A., Fowler, G., and Chacon, S., 2011. A simulation for exploring the effects of the 'trait list' method's subjectivity in consistency and accuracy of ancestry estimations. *Journal of Forensic Sciences*, **56**(5): 1094-1106.
- Siegel, N.D., and Ousley, S.D., 2011. The importance of testing and understanding statistical methods in the age of Daubert. Can Fordisc really classify individuals correctly only one percent of the time? *Proceedings of the American Academy of Forensic Sciences*, **17**: 364-365.
- Elliott, M., and Collard, M., 2009. Fordisc and the determination of ancestry from cranial measurements. *Biology Letters*, **5**: 849-852.

Week 5: 30th October 2018

Introduction to Trauma Analysis

Suggested readings:

- Currey, J.D., 2002. *Bones: Structure and Mechanics*. Princeton, NJ: Princeton University Press. **MEDICAL SCIENCES JB 5 CUR**
- Rodriguez-Martin, C., 2006. Identification and differential diagnosis of traumatic lesions of the skeleton. In Schmitt, A., Cunha, E., and Pinheiro, J. (eds), *Forensic anthropology and medicine*. Totowa, NJ: Humana Press, pp197-221. **INST ARCH JF SCH (TC 3494)**
- Sauer, N., 1998. The timing of injuries and manner of death: Distinguishing among antemortem, perimortem, and postmortem trauma. In Reichs, K. (ed), *Forensic Osteology*. Springfield, IL: Charles C Thomas. **INST ARCH BB1 REI**
- Von See, C., Bormann, K., Schuann, P., Goetz, F., Gellrich, N., and Rucker, M., 2009. Forensic imaging of projectiles using cone-beam computed tomography. *Forensic Science International*, **190**: 38-41.
- Horgan, T.J., and Gilchrist, M.D., 2003. The creation of three-dimensional finite element models for simulating head impact biomechanics. *International Journal of Crashworthiness*, **8**(4): 353-366.
- Reuhl, J., and Bratzke, H., 1999. Death caused by chainsaw - homicide, suicide or accident? A case report with a literature review (with 11 illustrations). *Forensic Science International*, **105**(1): 45-59.
- Pollanen, M., and Chiasson, D., 1996. Fracture of the hyoid bone in strangulation: Comparison of fracture and un-fractured hyoids from victims of strangulation. *Journal of Forensic Sciences*, **41**(1): 110-113.
- Dedouit, F., Tournel, G., Becart, A., Hedouin, V., and Gosset, D., 2007. Suicidal hanging resulting in complete decapitation – Forensic, radiological and anthropological studies: A case report. *Journal of Forensic Sciences*, **52**(5): 1190-1193.

Week 6: 6th November 2018

READING WEEK - NO CLASSES!

Week 7: 13th November 2018

Blunt Force Trauma: Classification and Biomechanics

Suggested readings:

- Calce, S., and Rogers, T., 2007. Taphonomic changes to blunt force trauma. *Journal of Forensic Sciences*, **52**(3): 519-527.
- Roth, S., Raul, J.S., Ludes, B., and Willinger, R., 2007. Finite element analysis of impact and shaking inflicted to a child. *International Journal of Legal Medicine*, **121**(3): 223-228.
- Christensen, A., 2004. The influence of behaviour on freefall injury patterns: Possible implications for forensic anthropological investigations. *Journal of Forensic Sciences*, **49**(1): 5-10.
- Berryman, H., and Symes, S., 1998. Recognising gunshot and blunt crania trauma through fracture interpretation. In Reichs, K. (ed), *Forensic Osteology*. Springfield, IL: Charles C Thomas, pp333-352. **INST ARCH BB1 REI**
- Doorly, M.C., and Gilchrist, M.D., 2006. The analysis of traumatic brain injury due to head impacts arising from falls using accident reconstruction. *Computer Methods in Biomechanics and Biomedical Engineering*, **9**(6): 371-377.
- Daegling, D., Warren, M., and Hotzman, J., and Self, C., 2008. Structural analysis of human rib fractures and implications for forensic interpretation. *Journal of Forensic Sciences*, **53**(6): 1301-1307.

Week 8: 20th November 2018

Sharp Force Trauma

Suggested readings:

- Bartelink, E.J., Wiersema, J.M., and Demaree, R.S., 2001. Quantitative analysis of sharp force trauma: An application of scanning electron microscopy in forensic anthropology. *Journal of Forensic Sciences*, **46**: 1288-1293.
- Walsh-Haney, H.A., 1999. Sharp-force trauma analysis and the forensic anthropologist: Techniques advocated by William R. Maples, PhD. *Journal of Forensic Sciences* **44**: 720-723.

- Campos Varela, I.Y., and Morcillo, M.D., 2011. Dismemberment: Cause of death in the Columbian armed conflict. Proceedings of the 63rd Annual Meetings of the American Academy of Forensic Sciences, Chicago, IL, Vol **17**: 356.
- Grellner, W., and Wilske, J., 2009. Unusual suicides of young women with tentative cuts and fatal neck injuries by chainsaw and circular saw. *Forensic Science International*, **190**(1-3): e9-e11.
- Freas, L., 2006. Assessment of wear related features of the kerf wall from saw marks in bone. *Journal of Forensic Sciences*, **55**(6): 1561-1569.
- Alunni-Perret, V., Muller-Bolla, M., Laugier, J.P., Lupi-Pegurier, L., Bertrand, M.F., Staccini, P., Bolla, M., and Quatrehomme, G., 2005. Scanning electron microscopy analysis of experimental bone hacking trauma. *Journal of Forensic Sciences*, **50**: 796-801.
- Lynn, K., and Fairgrieve, S.I., 2009. Macroscopic analysis of axe and hatchet trauma in fleshed and de-fleshed mammalian long bones. *Journal of Forensic Sciences*, **54**(4): 786-792.

Week 9: 27th November 2018

Ballistic and Projectile Trauma

Suggested readings:

- Di Maio, V.J.M., 1999. *Gunshot wounds: Practical aspects of firearms, ballistics, and forensic techniques 2/E*. Boca Raton: CRC Press. **INST ARCH JF DIM**
- Puentes, K., Taveira, F., Madureira, A.J., Santos, A., and Magalahaes, T., 2009. Three-dimensional reconstitution of bullet trajectory in gunshot wounds: A case report. *Journal of Forensic and Legal Medicine*, **16**: 407-410.
- Fenton, T., Stefan, V., Wood, L., and Sauer, N., 2005. Symmetrical fracturing of the skull from midline contact gunshot wounds: Reconstruction of individual death histories from skeletonised human remains. *Journal of Forensic Science*, **50**(2): 274-285.
- Berryman, H.E., Smith, O.C., and Symes, S.A., 1995. Diameter of cranial gunshot wounds as a function of bullet calibre. *Journal of Forensic Sciences*, **40**: 751-754.
- Leibovici, D., Gofrit, O., Stein, M., Shapira, S., Noga, Y., Heruti, R., et al., 1996. Blast injuries: Bus versus open air bombings – a comparative study of injuries in

- survivors of open air versus confined space explosions. *Journal of Trauma*, **41**: 1030-1035.
- Nor, F., and Das, S., 2012. Gunshot wound in skeletonised human remains with partial adipocere formation. *Journal of Forensic and Legal Medicine*, **19**(1): 42-45.
- Quatrehomme, G., and Iscan, M., 1999. Characteristics of gunshot wound in the skull. *Journal of Forensic Sciences*, **44**(3): 568-576.
- Smith, O., Berryman, H., Symes, S., Francisco, J., and Hnlica, V., 1993. Atypical gunshot exit defects to the cranial vault. *Journal of Forensic Sciences*, **38**(2): 339-343.
- Langley, N.R., 2007. An anthropological analysis of gunshot wounds to the chest. *Journal of Forensic Sciences*, **52**(3): 532-537.
- Chen, Y., Miao, Y., Xu, C., Zhang, G., Lei, T., and Tan, L., 2010. Wound ballistics of the pig mandibular angle: A preliminary finite element analysis and experimental study. *Journal of Biomechanics*, **43**(6): 1131-1137.
- Brown, H., Cauchi, D.M., Holden, J.L., Wrobel, H., and Cordner, S., 1999. Image analysis of gunshot residue on entry wounds I – the technique and preliminary study. *Forensic Science International*, **100**: 163-177.

Week 10: 4th December 2018

Using antemortem records for Identification ; CT/Radiographs

Suggested readings:

- Adams, B.J., 2003. Establishing personal identification based on specific patterns of missing, filled, and unrestored teeth. *Journal of Forensic Sciences*, **48**(3): 487-496.
- Freedman, A.J., Senn, D.R., and Arendt, D.M., 2005. Seven hundred seventy eight bite marks: Analysis by anatomic location, victim and biter demographics, types of crime, and legal disposition. *Journal of Forensic Sciences*, **50**(6): 1-8.
- Schmeling, A., Olze, A., Reisinger, W., and Geserick, G., 2001. Age estimation of living people undergoing criminal proceedings. *Lancet*, **358**: 89-90.
- Pludowski, P., Lebedowski, M., and Lorenc, R.S., 2004. Evaluation of the possibility to assess bone age on the basis of DXA derived hand scans – preliminary results. *Osteoporosis International*, **15**: 317-322.

-Adams, B.J., and Maves, R.C., 2002. Radiographic identification using the clavicle of an individual missing from the Vietnam conflict. *Journal of Forensic Sciences*, **48**(2): 369-373.

-Angyal, M., and Derczy, K., 1998. Personal identification on the basis of antemortem and postmortem radiographs. *Journal of Forensic Sciences*, **43**: 1089-1093.

-Christensen, A.M., 2004. The impact of Daubert: Implications for testimony and research in forensic anthropology (and the use of frontal sinuses in personal identification). *Journal of Forensic Sciences*, **49**(3): 427-430.

-Christensen, A.M., and Crowder, C.M., 2009. Evidentiary standards for forensic anthropology. *Journal of Forensic Sciences*, **54**(6): 1211-1216.

-Dedouit, R., Telmon, N., Costagliola, R., Otal, P., Florence, L.L., Joffre, F., and Rouge, D., 2007. New identification possibilities with postmortem multislice computed tomography. *International Journal of Legal Medicine*, **121**: 507-510.

-Kahana, T., Goldin, K., and Hiss, J., 2002. Personal identification based on radiographic vertebral fractures. *American Journal of Forensic Medicine and Pathology*, **23**(1): 36-41.

-Komar, D., and Lathrop, S., 2006. Frequencies of morphological characteristics in two contemporary forensic collections: Implications for identification. *Journal of Forensic Sciences*, **51**(5): 974-978.

-Quartrehomme, G., Balaguer, T., Staccini, P., and Alunni-Perret, V., 2007. Assessment of the accuracy of three-dimensional manual craniofacial reconstructions: A series of 25 controlled cases. *International Journal of Legal Medicine*, **121**: 469-475.

-Steadman, D.W., Adams, B.J., and Konigsberg, L.W., 2006. Statistical basis for positive identification in forensic anthropology. *American Journal of Physical Anthropology*, **131**(1): 15-26.

-Sudimak, J.R., Lewis, B.J., Rich, J., Dean, D.E., and Fardal, P.M., 2002. Identification of decomposed human remains from radiographic comparison of an unusual foot deformity. *Journal of Forensic Sciences*, **47**(1): 218-220.

-Ritz-Timme, S., Cattaneo, C., Collins, M.J., et al., 2000. Age estimation: The state of the art in relation to the specific demands of forensic practise. *International Journal of Legal Medicine*, **113**, pp.129-136.

-Schmeling, A., Grundmann, C., Fuhmann, A., et al., 2008. Criteria for age estimation in living individuals. *International Journal of Legal Medicine*, **122**, pp.457-460.

-Scientific Working Group for Forensic Anthropology (SWGANTH), 2013 (Revision 2). Age estimation. [Online] Available at: <<http://swganth.startlogic.com/Age%20Proposed%20Rev2.pdf>> [Accessed 10 August 2015].

7th December 2018

FINAL EXAM

(During your normal practical sessions)

Week 11: 11th December 2018

Dealing with Disaster & Disaster Victim Identification

Suggested readings:

-Morgan, O.W., Sribanditmongkol, P., Perera, C., et al., 2006. Mass fatality management following the South Asian tsunami disaster: case studies in Thailand, Indonesia, and Sri Lanka. *PloS Medicine*, **3**-6, pp.e195.

-Blau S, Briggs C.A., 2011. The role of anthropology in disaster victim identification (DVI). *Forensic Science International*, **205**(1-3), pp.29-35.

-Kahana T, Hiss J. The role of forensic anthropology in mass fatality incidents management. *Forensic Sci Policy Manag Int J*. 2009;**1**(3):144-9.

-Mundorff, A.Z., 2012. Integrating forensic anthropology into disaster victim identification. *Forensic Science, Medicine, and Pathology*, **8**-2, pp.131-139.

-Schuliar, Y., Chapenoire, S., Miras, A., et al., 2014. A new tool for coding and interpreting injuries in fatal airplane crashes: The Crash Injury Pattern Assessment Tool Application to the Air France Flight AF447 disaster (Rio de Janeiro-Paris), 1st of June 2009. *Journal of Forensic Sciences*, **59**-5, pp.1263-1270.

-Schuliar, Y. and Knudsen, P.J.T., 2012. Role of forensic pathologists in mass disasters. *Forensic Science, Medicine, and Pathology*, **8**, pp.164-173.

- Vidoli, G.M. and Mundorff, A.Z., 2012. Victim fragmentation patterns and seat location supplements crash data: American Airlines Flight 587. *Aviation, Space, and Environmental Medicine*, 83, pp.412-417.
- Mundorff, A.Z., 2012. Integrating forensic anthropology into disaster victim identification, *Forensic Science, Medicine and Pathology*, **8**: 131-139.
- Komar, D., 2008. Patterns of mortuary practice associated with genocide: Implications for archaeological research. *Current Anthropology*, **49**(1): 123-133.
- Lessig, R., and Rothschild, M., 2012. International standards in cases of mass disaster victim identification (DVI). *Forensic Science, Medicine, and Pathology*, **8**: 197-199.
- Lain, R., Taylor, J., Croker, S., Craig, P., and Graham, J., 2011. Comparative dental anatomy in Disaster Victim Identification: Lessons from the 2009 Victorian Bushfires. *Forensic Science International*, **205**: 36-39.
- Jensen, R.A., 1999. *Mass fatality and casualty incidents: A field guide*. Boca Raton: CRC Press. **INST ARCH JF JEN**
- Gould, R.A., 2007. *Disaster Archaeology*. Salt Lake City: The University of Utah Press. **INST ARCH JF GOU**
- Adams, B.J, and Byrd, J.E. (eds), 2008. *Recovery, analysis, and identification of commingled human remains*. New Jersey: Humana Press. **INST ARCH JF ADA** (CHAPTERS 2 'Spatial analysis of mass graves...', 3 'Pieces of the puzzle', 4 'Commingled remains and human rights investigations', 10 'Models and methods...' and 12 'How many people?..')
- Adams, B.J., and Byrd, J.E., 2006. Resolution of small-scale commingling: A case report from the Vietnam War. *Forensic Science International*, **156**: 63-69.
- Rainio, J., Hedman, M., Karkola, K., Lalu, K., Peltola, P., Ranta, H., Sajantila, A., Soderholm, N., and Penttila, A., 2001. Forensic osteological investigations in Kosovo. *Forensic Science International*, **121**: 166-173.
- L'Abbe, E.N., 2005. A case of commingled remains from rural South Africa. *Forensic Science International*, **151**: 201-206.
- Skinner, M., Alemijevic, D., and Djuric-Srejjic, M., 2003. Guidelines for international forensic bio-archaeology monitors of mass grave exhumations. *Forensic Science International*, **134**: 81-92.

ADDITIONAL INFORMATION

Libraries and other resources

In addition to the Library of the Institute of Archaeology, other libraries in UCL with holdings of particular relevance to this degree are: UCL Science Library, UCL Cruciform Library and UCL Main Library. Libraries outside of UCL which have holdings which may also be relevant to this degree are: Wellcome Institute Library, British Library.

Health and safety

The Institute has a Health and Safety policy and code of practice which provides guidance on laboratory work, etc. This is revised annually and the new edition will be issued in due course. All work undertaken in the Institute is governed by these guidelines and students have a duty to be aware of them and to adhere to them at all times. ***It should be noted that eating and drinking is not permitted in room 308 at any time.***

APPENDIX A: POLICIES AND PROCEDURES 2018-19(PLEASE READ CAREFULLY)

This appendix provides a short précis of policies and procedures relating to modules. It is not a substitute for the full documentation, with which all students should become familiar. For full information on Institute policies and procedures, see the IoA Student Administration section of Moodle:

<https://moodle.ucl.ac.uk/module/view.php?id=40867>

For UCL policies and procedures, see the Academic Regulations and the UCL Academic Manual:

<http://www.ucl.ac.uk/srs/academic-regulations> ; <http://www.ucl.ac.uk/academic-manual/>

GENERAL MATTERS

ATTENDANCE: A register will be taken at each class. If you are unable to attend a class, please notify the lecturer by email.

DYSLEXIA: If you have dyslexia or any other disability, please discuss with your lecturers whether there is any way in which they can help you. Students with dyslexia should indicate it on each coursework cover sheet.

COURSEWORK

LATE SUBMISSION: Late submission will be penalized in accordance with current UCL regulations, unless formal permission for late submission has been granted.

The UCL penalties are as follows:

- The marks for coursework received up to two working days after the published date and time will incur a 10 percentage point deduction in marks (but no lower than the pass mark).
- The marks for coursework received more than two working days and up to five working days after the published date and time will receive no more than the pass mark (40% for UG modules, 50% for PGT modules).
- Work submitted more than five working days after the published date and time, but before the second week of the third term will receive a mark of zero but will be considered complete.

GRANTING OF EXTENSIONS: Please note that there are strict UCL-wide regulations with regard to the granting of extensions for coursework. You are reminded that Module Coordinators are not permitted to grant extensions. All requests for extensions must be submitted on a the appropriate UCL form, together with supporting documentation, via Judy Medrington's office and will then be referred on for consideration. Please be aware that the grounds that are acceptable are limited. Those with long-term difficulties should contact UCL Student Disability Services to make special arrangements. Please see the IoA website for further information. Additional information is given here <http://www.ucl.ac.uk/srs/academic-manual/c4/extenuating-circumstances/>

RETURN OF COURSEWORK AND RESUBMISSION: You should receive your marked coursework within one month of the submission deadline. If you do not receive your work within this period, or a written explanation, notify the Academic Administrator. When your marked essay is returned to you, return it to the Module Coordinator within two weeks. You must retain a copy of all coursework submitted.

CITING OF SOURCES and AVOIDING PLAGIARISM: Coursework must be expressed in your own words, citing the exact source (author, date and page number; website address if applicable) of any ideas, information, diagrams, etc., that are taken from the work of others. This applies to all media (books, articles, websites, images, figures, etc.). Any direct quotations from the work of others must be indicated as such by being placed between quotation marks. Plagiarism is a very serious irregularity, which can carry heavy penalties. It is your responsibility to abide by requirements for presentation, referencing and avoidance of plagiarism. Make sure you understand definitions of plagiarism and the procedures and penalties as detailed in UCL regulations: <http://www.ucl.ac.uk/current-students/guidelines/plagiarism>

RESOURCES

MOODLE: Please ensure you are signed up to the module on Moodle. For help with Moodle, please contact Charlotte Frearson (c.frearson@ucl.ac.uk)