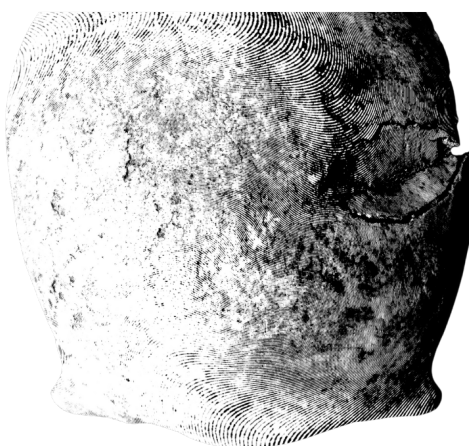


Potential changes in light of the COVID-19 pandemic

Please note that information regarding teaching, learning and assessment in this module handbook endeavours to be as accurate as possible. However, in light of the COVID-19 pandemic, the changeable nature of the situation and the possibility of updates in government guidance, there may need to be changes during the course of the year. UCL will keep current students updated of any changes to teaching, learning and assessment on the [Students' webpages](#). This also includes Frequently Asked Questions (FAQs) which may help you with any queries that you may have.

***ARCL0119: Forensic Anthropology***

2022-23, Term 1
MSc BAFA Core Module
15 Credits

Co-ordinator: LUCY SIBUN
l.sibun@ucl.ac.uk

Room 413, 4th Floor Institute of Archaeology
Office Hours: Mondays, 13.00 – 14.00

Please refer to the IoA Student Handbook and IoA Study Skills Guide:

<https://www.ucl.ac.uk/archaeology/current-students/ioa-student-handbook>

<https://www.ucl.ac.uk/archaeology/current-students/ioa-study-skills-guide>

for instructions on coursework submission, IoA referencing guidelines and marking criteria, as well as UCL policies on penalties for late submission, over-length work and academic misconduct.

1. MODULE OVERVIEW

MODULE DESCRIPTION

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 human 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.

MODULE AIMS & OBJECTIVES

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.

LEARNING OUTCOMES

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 of the limitations of profiling human remains
- have the ability to problem solve efficiently when confronted with human remains

Further, 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.

METHODS OF ASSESSMENT

This course is assessed by means of:

- (a) **one practical examination**, to be held on **FRIDAY 16th December 2022**, which will contribute 50% to the final grade for the course
- (b) **one essay of 2000 words**, which will contribute 50% to the final grade for the course. ****This is due on the 6th of January, 2023.**

COMMUNICATION

- **Moodle and MS Teams** are the main hubs for this module.
- Important information will be posted by staff in the **Announcements section of the Moodle page** and you will automatically receive an email notification for these.
- Please email any general queries relating to module content, assessments, and administration to the course coordinator.
- For personal queries, please contact the co-ordinator by email.

WEEK-BY-WEEK SUMMARY

Week	Lectures (Monday 11-12; 209)	Seminars (Monday 12-1; 209)	Practicals (Fridays, Room 308; 10-12 or 1-3)
1	Lecture: Introduction to Forensic Anthropology	Lecture: Understanding Sexual Dimorphism	Practical Lecture: Sex Estimation Methods Practical: Sex Estimation pelvis and skull
2	Lecture: Development and Senescence	Seminar: What methods should we be using for sex estimation? Why?	Practical Lecture: Methods for Aging Practical: Age Estimation
3	Lecture: Ancestry – History and Current Issues	Seminar: Documented Collections	Practical Lecture: Ancestry – Various methods and approaches Practical: Ancestry Estimation
4	Lecture: Positive Identification Methods (Ante Mortem Records/Radiographs)	Seminar: Ethics around Ancestry Estimation	Practical Lecture: Estimating Stature Practical: Stature Estimation and Taking Measurements
5	Lecture: Trauma Biomechanics	Seminar: Bias in Forensic Science	REVISION; Practice test
6	Reading week		
7	Lecture: Blunt Force Trauma	Seminar: Biological Profiling – Issues of Accuracy	Practical: Blunt Force Trauma Mini Lecture: BFT Case Studies
8	Lecture: Sharp Force Trauma	Seminar: Accreditation and Professionalisation	Practical: Sharp Force Trauma Mini Lecture: SFT Case Studies
9	Lecture: Gun Shot Trauma	Seminar: Data Visualisation and Presentation	Practical: Gun Shot Trauma Mini Lecture: GSW Case Studies
10	Lecture: Disasters and War	Lecture: Mass Fatality Incidents & DVI	REVISION SESSION
11	Seminar: Ethics in Forensic Anthro - Student led group discussion (2-hour seminar session)		EXAM

WEEKLY MODULE PLAN

The module is taught through lectures, discussion-based seminars and practicals. Students will be required to undertake set readings, and complete pre-class activities in order to be able to actively participate in the discussion. Seminar Readings will be posted to the Moodle on Mondays for the subsequent week.

WORKLOAD

This is a 15 credit module which equates to 150 hours of learning time including session preparation, background reading, and researching and writing your assignments. With that in mind you should expect to organise your time in roughly this way:

40 hours	Staff-led teaching sessions (lectures, seminars, tutorials, practical sessions)
40 hours	Self-guided session preparation (reading, listening, note-taking and online activities), about 6 hours a week
35 hours	Reading for, and writing, the research essay
35 hours	Preparing for the Practical Examination

2. ASSESSMENT

Each assignment and possible approaches to it will be discussed in class, in advance of the submission deadline. If students are unclear about the nature of an assignment, they should discuss this with the module coordinator in advance (via office hours or class Moodle forum). You will receive feedback on your written coursework via Moodle, and have the opportunity to discuss your marks and feedback with the coordinator in their office hours.

For more details see the 'Assessment' section on Moodle. The [IoA marking criteria](#) can be found in the IoA Student Handbook (Section 12: Information on assessment). The [IoA Study Skills Guide](#) provides useful guidance on writing different types of assignment.

Please note that **late submission**, **exceeding the maximum word count** and **academic misconduct (plagiarism)** will be penalized and can significantly reduce the mark awarded for the assignment and/or overall module result. On requirements, please do consult <https://www.ucl.ac.uk/archaeology/current-students/ioa-student-handbook/12-information-assessment> with sections 12.8: submission deadlines, 12.10: word count, 12.12–14: academic integrity.

ASSESSMENT 1: In-Class Practical Examination (50%)

The practical examination will take place on **FRIDAY 16th December 2022** during your normal practical session, in Room 308 (Osteology Lab). You will not have seen the specimens beforehand, and you are not allowed to use notes/books while taking the exam. Relevant methods (such as age estimation descriptions) will be provided. The specific nature of the exam will be discussed extensively during classes.

The test is written on a set of sheets which are provided for you, with a numbered area for each specimen that you can write in. So long as you write clearly, it will not matter what you write with (I will have some "emergency" pens and pencils that you can use in case of accident). It will not matter if your use of English is not grammatically correct so long as it is comprehensible – note form is satisfactory. If you spell terms correctly, you will be credited for it, but so long as your meaning is clear you will at least receive some credit for recognising that a feature is there. When your test has been marked, it will be returned to you with a feedback sheet giving a short paragraph on the features and deductions which it is felt, at a minimum, you might be able to make on each specimen. This is purely intended as feedback, to avoid making detailed comments on your paper, and does not in any way constitute a marking scheme for the test.

Please let the module coordinator know in advance of the examination if you are registered with UCL as having dyslexia or any other learning difficulty which requires me to offer you extra examination time or the use of a computer. Please also contact Judy Medrington (email j.medrington@ucl.ac.uk) about this.

ASSESSMENT 2: Essay of 2000 words (50%)

Deadline: 6th January 2023

Please select from **ONE** of the following essay topics:

- 1) Are virtual human remains (such as those from CT scans) governed by the same ethics as actual physical human remains?
- 2) Do age estimation methods from the os coxae in forensic anthropology meet the required levels of objectivity necessary for use in the UK legal system?
- 3) Should ancestry estimation continue being included as part of the biological profile? Justify your response
- 4) Are age-estimation methods from the wrist (using radiographs, CT and/or MRI) for **living** individuals reliable and precise enough to meet medico-legal requirements in the UK (or Europe)?

3. RESOURCES & PREPARATION FOR CLASS

You are expected to read the essential readings as well as review any practical content (through videos and extra resources) Moodle each week. Completing the readings is essential for your effective participation in the activities and discussions that we will do, and it will greatly enhance your understanding of the material covered. Further readings are provided via the online-reading list for you to get a sense of the range of current work on a given topic and for you to draw upon for your assessments. Online reading list will be found in Moodle under Basic texts and online resources.

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.

[Available Online with UCL Library]

Christensen, A., Passalacqua, N & Bartelink, E. (Eds) (2013). *Forensic Anthropology: Current Methods and Practice*. San Diego: Elsevier Science & Technology.

Boyd, C.C., & Boyd, D.C.,(Eds) (2018). *Forensic Anthropology: Theoretical Framework & Scientific Basis*. Newark: John Wiley & Sons.

Garvin, H.M., & Langley, N.R., (Eds) (2020). *Case studies in forensic anthropology: bonified skeletons*. Boca Raton: CRC Press.

Squires, K., Errickson, D., Marquez-Grant, N. (eds) (2020). *Ethical Approaches to human remains: A global challenge in Bioarchaeology & Forensic Anthropology*. Cham, Switzerland: Springer.

Blau, S., and Ubelaker, D. (eds) (2016). *Handbook of Forensic Anthropology and Archaeology 2/E*. New York; London: Routledge.

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

Wedel, V., & Galloway, A. (Eds) (2014). *Broken Bones: Anthropological analysis of blunt force trauma 2/E*. Springfield, Illinois: Charles C Thomas.

[Physical Books; No e-book available]

-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**

-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 CO**

RELEVANT JOURNALS

- American Journal of Biological Anthropology (formerly American Journal of Physical Anthropology)
- Australian Journal of Forensic Sciences
- Forensic Science International
- Journal of Forensic and Legal Medicine
- Journal of Forensic Sciences
- Science and Justice
- American Journal of Forensic Medicine and Pathology

Other:

- Royal Anthropological Institute, 2018. Codes of Practice for Forensic Anthropology, Issue 1. Available at: <https://www.gov.uk/government/consultations/code-of-practice-for-forensic-anthropology>

4. SYLLABUS

The following is an outline for the module content (week by week) 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: INTRODUCTION TO FORENSIC ANTHROPOLOGY

UNDERSTANDING SEXUAL DIMORPHISM & METHODS FOR SEXING THE SKELETON

Essential Readings:

- Bethard, J.D. and DiGangi, E.A., (2019). 'From the laboratory to the witness stand: research trends and method validation in forensic anthropology', *Forensic anthropology and the United States Judicial System*, pp.41-52.
- Klales, A.R., (2021). 'Current State of Sex Estimation in Forensic Anthropology', *Forensic Anthropology*, **4**(2), p.118.
- Walker, P.L., (2008). 'Sexing skulls using discriminant function analysis of visually assessed traits', *American Journal of Physical Anthropology*, **136**: 39-50.
- Brůžek J. (2002). A method for visual determination of sex, using the human hip bone. *American Journal of Physical Anthropology*, **117**:157–168.
- Klales, A.R., Ousley, S.D., Vollner, J.M., (2012). 'A revised method of sexing the human innominate using Phenice's nonmetric traits and statistical methods', *American Journal of Physical Anthropology*, **149**(1): 104-114.

Further readings:

- Tallman, S.D., Kincer, C.D. and Plemons, E.D., (2021). 'Centering transgender individuals in forensic anthropology and expanding binary sex estimation in casework and research', *Forensic Anthropology*.
- 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.

- Bartelink, E.J., Boyd, D.C., France, D.L., Pokines, J.T. and Prince-Zinni, D. (2020). 'The American Board of Forensic Anthropology Turns 40: Historical Perspectives and Current Trends in Certification for Forensic Anthropology', *Forensic Anthropology*, **3**(2), p.103.
- 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.
- Klales, A.R. and Cole, S.J. (2017). 'Improving nonmetric sex classification for Hispanic individuals', *Journal of Forensic Sciences*, **62**(4), pp.975-980.
- Lesciotto, K.M., and Doershuk, L.J. (2018). 'Accuracy and Reliability of the Klales et al. (2012) Morphoscopic Pelvic Method', *Journal of Forensic Sciences*, **63**(1): 214-220.
- 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.
- Walker, P.L. (2005). 'Greater sciatic notch morphology: Sex, age, and population differences', *American Journal of Physical Anthropology*, **127**: 385-391.
- 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.

Week 2: 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.
- Hartnett, K.M. (2010). 'Analysis of age-at-death estimation using data from a new, modern autopsy sample—part I: pubic bone', *Journal of Forensic Sciences*, **55**(5), pp.1145-1151.
- 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.
- Schanandore, J.V., Wolden, M. and Smart, N. (2022). 'The accuracy and reliability of the Suchey–Brooks pubic symphysis age estimation method: Systematic review and meta-analysis', *Journal of Forensic Sciences*, **67**(1), pp.56-67.

Suggested Readings:

- Hartnett, K.M. (2010). 'Analysis of age-at-death estimation using data from a new, modern autopsy sample—Part II: Sternal end of the fourth rib', *Journal of Forensic Sciences*, **55**(5), pp.1152-1156.
- 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.
- 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 Íscan's method really work?', *Legal Medicine*, **31**: 24-29.
- Merritt, C.E. (2015). 'The influence of body size on adult skeletal age estimation methods', *American Journal of Physical Anthropology*, **156**(1): 35-57.
- 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.

Week 3: ANCESTRY ESTIMATION – HISTORY AND CURRENT ISSUES; METHODS FOR ESTIMATING ANCESTRY

Essential Readings

- Hefner, J. (2009). 'Cranial nonmetric variation and estimating ancestry', *Journal of Forensic Sciences*, **54**(4): 985-995.
- Dunn, R.R., Spiros, M.C., Kamnikar, K.R., Plemons, A.M., and Hefner, J.T. (2020) 'Ancestry estimation in forensic anthropology: A review', *WIREs Forensic Science*, e1369.
- DiGangi, E.A. and Bethard, J.D., 2021. Uncloaking a lost cause: Decolonizing ancestry estimation in the United States. *American Journal of Physical Anthropology*, **175**(2), pp.422-436.
- Pilloud, M.A., Skipper, C.E., Horsley, S.L., Alba, C., Latham, K., Clemmons, C.M., Zejdlik, K., Boehm, D.A. and Philbin, C.S. (2021). 'Terminology used to describe human variation in forensic anthropology', *Forensic Anthropology*, **4**(4), p.119.

Suggested readings

- Tallman, S.D., Parr, N.M. and Winburn, A.P. (2021). 'Assumed differences; unquestioned typologies: The oversimplification of race and ancestry in forensic anthropology', *Forensic Anthropology*, **4**(4), p.73.
- Ross, A.H. and Williams, S.E., (2021). 'Ancestry studies in forensic anthropology: Back on the frontier of racism', *Biology*, **10**(7), p.602.
- Ross, A.H. and Pilloud, M. (2021). 'The need to incorporate human variation and evolutionary theory in forensic anthropology: A call for reform', *American Journal of Physical Anthropology*, **176**(4), pp.672-683.
- Plemons, A. and Hefner, J. (2016). 'Ancestry Estimation Using Macromorphoscopic Traits', *Academic Forensic Pathology*, **6**(3): 400-412.
- Edgar, H. and Pilloud, M. (2021). 'A Reassessment of Assessing Race:" Ancestry" Estimation and Its Implications for Forensic Anthropology and Beyond', *Forensic Anthropology*, **4**(4), pp.67-73.
- 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.
- Gravlee, C.C. (2009). 'How Race becomes Biology: Embodiment of Social Inequality', *American Journal of Physical Anthropology*, **139**: 47-57.
- Adams, D.M. and Pilloud, M.A. (2022). 'Perceptions of race and ancestry in teaching, research, and public engagement in biological anthropology', *Human Biology*, **93**(1), pp.9-32.
- Adams, D.M. and Pilloud, M.A. (2021). 'The (mis) appropriation of biological anthropology in race science and the implications for forensic anthropology', *Forensic Anthropology*, **4**(4), p.97.
- Flouri, D.E., Alifragki, A., García-Donas, J.G. and Kranioti, E.F. (2022). 'Ancestry Estimation: Advances and Limitations in Forensic Applications', *Research and Reports in Forensic Medical Science*, **12**, pp.13-24.
- Hefner, J.T., (2018). 'The macromorphoscopic databank', *American Journal of Physical Anthropology*, **166**(4), pp.994-1004.
- Hefner, J.T. and Ousley, S.D. (2014). 'Statistical classification methods for estimating ancestry using morphoscopic traits', *Journal of Forensic Sciences*, **59**(4), pp.883-890.
- Kenyhercz, M.W., Klaes, A.R., Rainwater, C.W. and Fredette, S.M. (2017). 'The optimized summed scored attributes method for the classification of US blacks and whites: A validation study', *Journal of Forensic Sciences*, **62**(1), pp.174-180.
- Maier, C., Craig, A. and Adams, D.M. (2021). 'Language use in ancestry research and estimation', *Journal of Forensic Sciences*, **66**(1), pp.11-24.
- Spiros, M.C. and Hefner, J.T. (2020). 'Ancestry estimation using cranial and postcranial macromorphoscopic traits', *Journal of Forensic Sciences*, **65**(3), pp.921-929.
- Spiros, M.C. (2019). 'Standardization of postcranial nonmetric traits and their utility in ancestry analysis', *Forensic Anthropology*, **2**(1), p.29.

Week 4: METHODS FOR POSITIVE IDENTIFICATION; ESTIMATING STATURE

Essential Readings:

- Raxter, M.H., Auerbach, B.M. and Ruff, C.B. (2006). 'Revision of the Fully technique for estimating stature', *American Journal of Physical Anthropology*, **130**(3): 374-384.

- Carew, R.M., Viner, M.D., Conlogue, G., Márquez-Grant, N. and Beckett, S. (2019). 'Accuracy of computed radiography in osteometry: A comparison of digital imaging techniques and the effect of magnification', *Journal of Forensic Radiology and Imaging*, **19**: 100348.
- Carew, R.M., Morgan, R.M. and Rando, C. (2019). 'A Preliminary Investigation into the Accuracy of 3D Modeling and 3D Printing in Forensic Anthropology Evidence Reconstruction', *Journal of Forensic Sciences*, **64**: 342-352.
- Robles, M., Rando, C. & Morgan, R.M. (2020). 'The utility of three-dimensional models of paranasal sinuses to establish age, sex, and ancestry across three modern populations: A preliminary study', *Australian Journal of Forensic Sciences*, **54**(3), pp.326-345.
- 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*, **64**(1), pp.171-174.

Suggested readings:

- Belcher, W.R., Shiroma, C.Y., Chesson, L.A., Berg, G.E. and Jans, M. (2022). 'The role of forensic anthropological techniques in identifying America's war dead from past conflicts', *Wiley Interdisciplinary Reviews: Forensic Science*, **4**(3), p.e1446.
- 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**: 183-e1.
- Ingvaldstad, M.E. and Walter, B.S. (2022). 'The impact of antimeric lower limb length asymmetry on adult stature estimation', *Journal of Forensic Sciences. Online Only*
- 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.
- 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.
- 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*, **167**(1), pp.20-31.
- 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.
- 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**: 277-e1.

Week 5: INTRODUCTION TO TRAUMA ANALYSIS

Essential readings:

- Blau, S. (2017). 'How Traumatic: A Review of the Role of the Forensic Anthropologist in the Examination and Interpretation of Skeletal Trauma', *Australian Journal of Forensic Sciences*, **49**(3): 261-280.
- Christensen, A.M., Hefner, J.T., Smith, M.A., Webb, J.B., Bottrell, M.C. and Fenton, T.W. (2018). 'Forensic fractography of bone: A new approach to skeletal trauma analysis', *Forensic Anthropology*, **1**(1), p.32.
- Delabarde, T., Reynolds, M., Decourcelle, M., Pascaretti-Grizon, F. and Ludes, B. (2020). 'Skull fractures in forensic putrefied/skeletonised cases: the challenge of estimating the post-traumatic interval', *Morphologie*, **104**(344), pp.27-37.

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**
- Wieberg, D.A.M. and Wescott, D.J. (2008). 'Estimating the Timing of Long Bone Fractures: Correlation Between the Postmortem Interval, Bone Moisture Content, and Blunt Force Trauma Fracture Characteristics', *Journal of Forensic Sciences*, **53**(5): 1028-1034.

Week 6: READING WEEK - NO CLASSES!

Week 7: BLUNT FORCE TRAUMA

Essential Readings:

- Passalacqua, N.V., and Fenton, T.W. (2012). 'Developments in Skeletal Trauma: Blunt Force Trauma', In Dirkmaat, D.C. (ed) *A Companion to Forensic Anthropology*. Oxford: Wiley-Blackwell, pp400-411. **INST ARCH JF DIR**
- Galloway, A., and Wedel, V. (2014). 'Chapter 7: Common Circumstances of Blunt Force Trauma', In, Wedel, V., & Galloway, A. (Eds) *Broken Bones: Anthropological analysis of blunt force trauma 2/E*. Springfield, Illinois: Charles C Thomas.

Suggested readings:

- Scheirs, S., Malgosa, A., Sanchez-Molina, D., Ortega-Sánchez, M., Velázquez-Ameijide, J., Arregui-Dalmases, C., Medallo-Muñiz, J. and Galtés, I. (2017). New insights in the analysis of blunt force trauma in human bones. Preliminary results', *International Journal of Legal Medicine*, **131**(3), pp.867-875.
- Scheirs, S., Hevink, B., Ortega-Sánchez, M., Jordana, X., McGlynn, H., Rodriguez-Baeza, A., Malgosa, A. and Galtés, I. (2019). 'Intra vitam trauma pattern: changing the paradigm of forensic anthropology?', *International Journal of Legal Medicine*, **133**(2), pp.661-668.
- 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.
- 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 8: SHARP FORCE TRAUMA

Essential Readings:

- 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.
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- Love, J. (2019). 'Sharp force trauma analysis in bone and cartilage: A literature review', *Forensic Science International*, **302**: 119-127.

Suggested readings:

- Rubin, K.M. (2021). 'Patterns of Intentional Dismemberment in Florida Medicolegal Death Investigations', *Forensic Anthropology*, **4**(1), p.45.

- Greathouse, H. (2021). 'Identifying Handsaw Tooth Shape Based on the Micro-and Macroscopic Analysis of the Kerf Floor Contour', *Forensic Anthropology*, **4**(1), p.20.
- 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.
- 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.
- 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: GUNSHOT TRAUMA

Essential readings:

- Quatrehomme, G., and Iscan, M. (1999). 'Characteristics of gunshot wound in the skull', *Journal of Forensic Sciences*, **44**(3): 568-576.
- Berryman, H.E. (2019). 'A systematic approach to the interpretation of gunshot wound trauma to the cranium', *Forensic Science International*, **302**: 306-317.
- Veenstra, A., Kerkhoff, W., Oostra, R.J. and Galtés, I. (2022). 'Gunshot trauma in human long bones: towards practical diagnostic guidance for forensic anthropologists', *Forensic Science, Medicine and Pathology*, pp.1-9.

Suggested readings:

- Martrille, L. and Symes, S.A. (2019). 'Interpretation of long bones ballistic trauma', *Forensic Science International*, **302**: 109890
- Puentes, K., Taveira, F., Madureira, A.J., Santos, A., and Magalhães, 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.
- 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.
- 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**
- Veenstra, A., Kerkhoff, W., Oostra, R.J. and Galtés, I. (2022). 'Gunshot trauma in human long bones: towards practical diagnostic guidance for forensic anthropologists', *Forensic Science, Medicine and Pathology*, pp.1-9.

Week 10: MASS FATALITY INCIDENTS – DISASTERS AND WAR; DISASTER VICTIM IDENTIFICATION

Essential Readings:

- de Boer, H.H., Blau, S., Delabarde, T. and Hackman, L. (2019). 'The role of forensic anthropology in disaster victim identification (DVI): recent developments and future prospects', *Forensic Sciences Research*, **4**(4), pp.303-315.
- Ubelaker, D.H., Shamlou, A. and Kunkle, A.E. (2019). 'Forensic anthropology in the global investigation of humanitarian and human rights abuse: Perspective from the published record', *Science & Justice*, **59**(2), pp.203-209.

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): e195.

- Kahana, T. and Hiss, J. (2009). 'The role of forensic anthropology in mass fatality incidents management', *Forensic Science Policy and Management*, **1**(3), pp.144-149.
- Mundorff, A.Z. (2012). 'Integrating forensic anthropology into disaster victim identification', *Forensic Science, Medicine, and Pathology*, **8**(2): 131-139.
- 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**: 412-417.
- 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.
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- Skinner, M., Alemijevic, D., and Djuric-Srejic, M. (2003). 'Guidelines for international forensic bio-archaeology monitors of mass grave exhumations', *Forensic Science International*, **134**: 81-92.
- Ubelaker, D.H. and Wu, Y. (2020). 'Fragment analysis in forensic anthropology', *Forensic Sciences Research*, **5**(4), pp.260-265.
- Knüsel, C.J. and Outram, A.K. (2004). 'Fragmentation: the zonation method applied to fragmented human remains from archaeological and forensic contexts', *Environmental Archaeology*, **9**(1), pp.85-98.
- Schuliar, Y., Chapenore, 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): 1263-1270.
- Schuliar, Y. and Knudsen, P.J.T. (2012). 'Role of forensic pathologists in mass disasters', *Forensic Science, Medicine, and Pathology*, **8**: 164-173.

Week 11: Student-led Seminars on Ethics & EXAM (16th December 2022)

- See the moodle tab 'Seminars' for list of articles.