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| **DERS TANIMI** |

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| **Ders Adı** | **Ders Kodu** | **Yarıyıl** | **T+U Saat** | **Kredi** | **AKTS** |
| **BİTKİLERDE MİNERAL BESLENME FİZYOLOJİSİ** | **BİYO-453** | **7** | **2+0** | **2** | **3** |

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| **Ön Koşul Dersleri** | Yok |
| **Önerilen Dersler** | Yok |
| **Dersin Veriliş Biçimi** | Yüz yüze |

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| **Dersin Dili** | Türkçe  |
| **Dersin Seviyesi** | Lisans  |
| **Dersin Türü** | Seçmeli  |
| **Staj Durumu** | Yok  |
| **Dersin Koordinatörü** |   |
| **Dersi Verenler** | Doç. Dr. Muhittin DOGAN  |
| **Dersin Yardımcıları** |   |
| **Dersin Amacı** | Bu dersle ögrencilere bitkilerde mineral beslenmenin fizyolojisi ögretilmesi amaçlanmaktadir.  |

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| **Dersin İçeriği** | Bitki fizyolojisine giris, su metabolizmasi, mineral madde metabolizmasi, azot metabolizmasi, enerji metabolizmasi, karbon metabolizmasi  |

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| **DERSİN ÖĞRENME ÇIKTILARI** |

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| **Dersin Öğrenme Çıktıları** | **Öğretim Yöntem ve Teknikleri** | **Ölçme Yöntemleri** |
| **Bu dersi başarı ile tamamlayan öğrenciler;** |  |  |
| **1)** Bitkilerdeki mineral beslenme olayların nasıl gerçekleştiğini öğrenecektir. | 1,2,3 | A,C |  |
| **2)** Bitkilerde su metabolizmasının nasıl gerçekleştiğini öğrenecektir | 1,2,3 | A,C |  |
| **3)** Bitki besin elementlerinin fonksiyonlarını, eksiklik ve fazlalığının etkilerini öğrenecektir | 1,2,3 | A,C |  |
| **4)** Bitki beslemede kullanılan yöntemleri öğrenecektir. | 1,2,3 | A,C |  |

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| **Öğretim Yöntem ve Teknikleri** |   | 1 - Anlatım, 2 - Soru - Cevap, 3 - Tartışma |
| **Ölçme Yöntemleri** |   | A - Sınav, C - Ödev |

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| **DERS AKIŞI** |

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| **Hafta** | **Konular** |  | **Ön Hazırlık** |
| **1** | Bitkilerde mineral beslenme alaninda günümüze kadar yapilan çalismalar  |   | 1  |  |
| **2** | Mutlak gerekli besin elementleri  |   | 1  |  |
| **3** | Mutlak gerekli besin elementlerinin belirlenme yöntemleri  |   | 1  |  |
| **4** | Bitki besin elementlerinin kaynagi olarak toprak  |   | 1  |  |
| **5** | Bitkilerde besin elementi alimi  |   | 1  |  |
| **6** | Bitkilerde besin elementi tasinmasi  |   | 1  |  |
| **7** | Bitki-su iliskileri  |   | 1  |  |
| **8** | Ara Sinav  |   |   |  |
| **9** | Bitki besin elementlerinin fonksiyonlari, eksiklik ve fazlaliklarinin etkileri: N, P,K  |   | 1  |  |
| **10** | Bitki besin elementlerinin fonksiyonlari, eksiklik ve fazlaliklarinin etkileri: Ca, Mg, S  |   | 1  |  |
| **11** | Bitki besin elementlerinin fonksiyonlari, eksiklik ve fazlaliklarinin etkileri: Fe, Mn, Zn  |   | 1  |  |
| **12** | Bitki besin elementlerinin fonksiyonlari, eksiklik ve fazlaliklarinin etkileri: Cu, B, Mo, Cl  |   | 1  |  |
| **13** | Yararli elementler  |   | 1  |  |
| **14** |  Islenen konularin genel degerlendirilmesi  |   | 1  |  |

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| **ZORUNLU YA DA ÖNERİLEN KAYNAKLAR** |

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| **Ders Notu** |   |
| **Diğer Kaynaklar** | Kaynak 1 Kaçar, B, Katkat, V: Bitki Besleme, Nobel Yay., 2009  |

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| **DERSİN PROGRAM ÇIKTILARINA KATKISI** |

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| No | Program Öğrenme Çıktıları |   |

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| Katkı Düzeyi |
| **1** | **2** | **3** | **4** | **5** |

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| 1 | Canlı sistemleri anlamaya yönelik deneysel çalışmalar yapma, sonuçlarını analiz etme ve yorumlayabilme |   |

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| 2 | Canlıları ve canlı sistemlerin işleyişini açıklayabilme |   |

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| 3 | Çevre ve biyolojik çeşitliliği koruma farkındalığı |   |

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| 4 | Biyolojik uygulamalar için modern teknik ve araçları kullanabilme becerisi |   |

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| 5 | Elde ettiği bilgi birikimini sözlü ve yazılı olarak ifade edebilme becerisi |   |

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| 6 | Bireysel ve grup halinde çalışabilme becerisi |   |

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| 7 | Kazanımların ülke ekonomisine katkı yapabilecek ürüne dönüştürebilme becerisi |   |

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| 8 | Zamanın biyolojik gelişimlerini takip etme bilinci |   |

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| 9 | Mesleki ve etik sorumluluk bilinci |   |

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| 10 | Mesleki özgüven geliştirebilme |   |

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| **DEĞERLENDİRME YÖNTEM VE KRİTERLERİ** |

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| **YARIYIL İÇİ ÇALIŞMALARI** | **SAYISI** | **KATKI YÜZDESİ** |
| Ara Sınav | 1 | %40 |
| **Toplam** | 1 | %40 |
| Yıliçinin Başarıya Oranı |   | %40 |
| Finalin Başarıya Oranı |   | %60 |
| **Toplam** |   | %100 |

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| **DERS KATEGORİSİ** |

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| **Destek Dersleri** | **X** |

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| **AKTS / İŞ YÜKÜ TABLOSU** |

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| --- | --- | --- | --- |
| **Etkinlik** | **SAYISI** | **Süresi(Saat)** | **Toplam İş Yükü(Saat)** |
| Derse Katılım | 14 | 2 | 28 |
| Sınıf Dışı Ders Çalışma Süresi(Ön çalışma, pekiştirme) | 14 | 3 | 42 |
| Arasınavlar için Bireysel Çalışma | 1 | 5 | 5 |
| Yarıyıl Sonu Sınavı için Bireysel Çalışma | 1 | 5 | 5 |
| **Toplam İş Yükü(Saat)** |   |   | 80 |
| **Toplam İş Yükü(Saat)/ 30 (s)** |   |   | 2,66 |
| **Dersin AKTS Kredisi** |   |   | 3 |

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